

4.0 IMPACTS OF THE ALTERNATIVES

The terms "effect" and "impact" are used synonymous under NEPA. Impacts includes ecological, aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative. Direct effects are caused by the action and occur at the same time and place and Indirect effects are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems. Cumulative impacts are those impacts on the environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Sections 4.1 through 4.3 of this document discusses the direct and indirect impacts on the physical, biological, and socio-economic environment that are likely to occur under each of the proposed alternatives, including the status quo alternative. Section 4.4 presents the reasonably foreseeable cumulative effects of the environment from the proposed alternatives.

4.1 Physical Impacts

PHYSICAL ENVIRONMENT - COMPARISON OF THE ALTERNATIVES	
PHYSICAL STRUCTURE	Changes to the physical environment as a result of VMS regulations
Alternative 1 Status quo	<p><u>Direct impact</u> No direct impacts beyond what has been considered in previous NEPA documents.</p> <p><u>Indirect impact</u> Little data available to assess OA fishing location and intensity.</p>
Alternative 2 Vessels using longline gear	<p><u>Direct impact</u> Data from vessels 165 vessels using longline gear to take and retain, possess or land OA groundfish (approximately 131 directed groundfish, 31 Pacific halibut, CA halibut, and 2 HMS vessels) could be used to maintain the integrity of habitat protection areas from longline effects. Unforeseen effects on the physical environment resulting from illegal fishing in the RCAs or habitat areas for OA vessels using longline gear will likely be reduced as a result of the deterrent effect.</p> <p><u>Indirect impact</u> VMS data can be combined with data on fishing gear impacts and habitat to better understand how effort shifts and closed area management measures affect the physical environment. Data would be available from 165 vessels using longline gear to take and retain, possess or land OA groundfish (approximately 131 directed groundfish, 31 Pacific halibut, 1 CA halibut, and 2 HMS vessels) .</p>
Alternative 3 Vessels using longline or pot gear	<p>In addition to impacts identified under Alt. 2</p> <p><u>Direct impact</u> Adds data from 128 vessels that take and retain, possess or land OA groundfish with pot gear (approximately 30 directed, 45 Dungeness crab, 8 prawn, 8 CA sheephead, and 37 CA halibut) could be used to maintain the integrity of habitat protection areas from pot fishing gear impacts. Deterrent effect will likely reduce RCA or habitat area incursions by vessels identified under this Alt.</p> <p><u>Indirect impact</u> Adds VMS position data from approximately 128 vessels (30 directed, 45 Dungeness crab, 8 prawn, 8 CA sheephead, and 37 CA halibut) that can be combined with data on fishing gear impacts and habitat to better understand effort shifts and the potential effects on the physical environment from closed area management measures.</p>
Alternative 4 Vessels using longline, pot or trawl gear, except: pink shrimp trawl	<p>In addition to impacts identified under Alt. 2 and 3</p> <p><u>Direct impact</u> Data from 41 vessels using trawl gear, excluding pink shrimp, to take and retain, possess or land OA groundfish (from approximately 18 ridgeback prawn, 6 sea cucumber and 17 CA halibut vessels) that could be used to maintain the integrity of habitat protection areas from trawl gear affects. Deterrent effect will likely reduce RCA or habitat area incursions by vessels identified under this Alt.</p> <p><u>Indirect impact</u> Provides VMS position data from approximately 41 vessels (18 ridgeback prawn, 6 sea cucumber and 17 CA halibut vessels) that can be combined with data on fishing gear impacts and habitat to better understand effort shifts and potential effects on the physical environment from closed area management measures. Understanding where bottom trawl effort is distributed will likely be the most important because trawl gear is believed to have greater impact on physical habitat than OA fixed gears.</p>

<p>Alternative 5A Vessels using longline, pot, trawl or line gear, except: pink shrimp trawl and salmon troll</p>	<p>In addition to impacts identified under Alt. 2, 3 and 4</p> <p><u>Direct impact</u> Data from 855 vessels using line gear, excluding salmon troll, to take and retain, possess or land OA groundfish (approximately 738 groundfish, 105 California halibut, and 12 HMS vessels) could be used to maintain the integrity of habitat protection areas from line gear impacts. Deterrent effect will likely reduce RCA or habitat area incursions by vessels identified under this Alt.</p> <p><u>Indirect impact</u> Provides VMS position data from approximately 855 vessels (738 groundfish, 105 California halibut, and 12 HMS vessels) using line gear to take and retain, possess or land OA groundfish, that can be combined with data on fishing gear impacts and habitat to better understand effort shifts and the potential effects on the physical environment from closed area management measures.</p>
<p>Alternative 5B Vessels using longline, pot, trawl or line gear, except: pink shrimp trawl, HMS longline and line, and Dungeness crab pot gear</p>	<p><u>Direct impact</u> Data from 163 vessels using longline gear as identified under Alt. 2 (excluding 2 HMS vessels); 83 vessels using pot gear as identified under Alt.3. (excluding 45 Dungeness crab vessels); 41vessels using trawl gear as identified under Alt.4, and 1,020 vessels using line gear as identified under Alt. 5A (plus177 salmon troll vessels coastwide) that take and retain, possess or land OA groundfish could be used to maintain the integrity of habitat protection areas from longline, pot, trawl, and line gear impacts. Deterrent effect will likely reduce RCA or habitat area incursions by vessels identified under this Alt.</p> <p><u>Indirect impact</u> Provides VMS position data from approximately 1,307 vessels that can be combined with data on fishing gear impacts and habitat to better understand effort shifts and the potential effects on the physical environment from closed area management measures. These vessels include 163 vessels using longline gear as identified under Alt. 2, except that HMS vessels would be excluded; 83 vessels using pot gear as identified under Alt.3., excluding Dungeness crab vessels; 41vessels using trawl gear as identified under Alt.4; and 1,020 vessels using line gear to take and retain, possess or land groundfish as identified under Alt. 5A, except HMS vessels using line gear are excluded, and including approximately 241 salmon troll vessels.</p>
<p>Alternative 6A Vessels with RCA restrictions; except pink shrimp trawl</p>	<p><u>Direct impact</u> Data from 1,423 vessels could be used to maintain the integrity of habitat protection areas from longline, pot, trawl, line, net and other fishing gear impacts. Includes data from: vessels using longline gear as identified under Alt. 2 except that all Pacific halibut vessels are included; 128 vessels using pot gear identified under Alt. 3; all vessels using trawl gear (approximately 32 ridgeback prawn, 14 Sea cucumber, and 34 California halibut vessels); 1,032 vessels using line gear as identified under Alt. 5B (includes salmon troll coastwide and 12 HMS vessels) to take and retain, possess or land OA groundfish; vessels using net gear (approximately 3 CPS vessels); and 4 vessels using other OA gears (approximately 4 vessels). Deterrent effect will likely reduce RCA or habitat area incursions by vessels identified under this Alt.</p> <p><u>Indirect impact</u> Provides VMS position data from approximately 1,423 vessels that can be combined with data on fishing gear impacts and habitat to better understand effort shifts and the potential effects on the physical environment from closed area management measures. These vessels include: 214 vessels using longline gear as identified under Alt. 2, except that all 49 Pacific halibut vessels are included; 128 vessels using pot gear identified under Alt. 3; 80 vessels using trawl gear includes approximately 32 ridgeback prawn, 14 Sea cucumber, and 34 California halibut vessels; 1,032 vessels using line gear to take and retain, possess or land OA groundfish as identified under Alt. 5B (includes salmon coastwide and 12 HMS vessels), vessels using net gear (trammel, gillnet, setnet) include approximately 3 CPS vessels, and approximately 4 vessels using other OA gears.</p>

<p>Alternative 6B Vessels with RCA restrictions: except salmon troll north that retain only yellowtail rockfish and pink shrimp trawl</p>	<p><u>Direct impact</u> Essentially the same as Alt. 6A except that data that could be used to maintain the integrity of areas closed to protect habitat from fishing gear impacts is not available for salmon troll vessels that retain only yellowtail rockfish north of 40°10' N. lat. would not be available. Total of 1,289 vessels.</p> <p><u>Indirect impact</u> Essentially the same as Alt. 6A except that position data from salmon troll vessels that retain only yellowtail rockfish north of 40°10' N. lat. would not be available.</p>
<p>Alternative 7 Vessel >12 ft with RCA restriction; except, pink shrimp trawl</p>	<p><u>Direct impact</u> Essentially the same as 6A except that data from approximately 22 vessels (6 longline, 2 pot, and 14 line gear vessels) would not be available. Total of 1,401 vessels.</p> <p><u>Indirect impact</u> Essentially the same as 6A except that data from approximately 22 vessels (6 longline, 2 pot, and 14 line gear vessels) would not be available. It is likely that none of these small vessels are not fishing outside of 3 miles.</p>
<p>Each of the alternatives identifies and estimated number of vessels that are likely to be affected by the VMS requirement. These values are based on the average level of participation from 2000 to 2003. However, it is important to point out that these values may not be the actual number of vessels that would continue to use a particular gear type if VMS requirements were adopted due to the easy ability of directed groundfish fishers to change gears or for incidental groundfish fishers to discontinue participation in the OA fisheries by not retaining groundfish species.</p>	

4.1.1 Physical structure

Direct impacts on the physical environment from fishery management actions generally result from changes to the structure of the benthic environment as a result of fishing practices.

The proposed action pertains to a program that is expected to provide information for monitoring fishing locations in relation to time/area closures. Fleet coverage level, that portion of the overall open access fishing fleet that would be required to have VMS and provide declaration reports, is the only difference between the proposed alternatives. Each of the 9 alternatives defines the portion of the open access fleet, that would be required to carry and use VMS transceivers and provide gear declaration reports.

Direct effects on the physical environment could occur if the gathering of the position information resulted in changes to fishing gear impacts on the physical structure or habitat. VMS data could be used to maintain the integrity of habitat protection areas designed to protect the physical environment from fishing gear impacts. Different fishing gears have different effects on the benthic environment. Further discussion on the different direct effects of the gears used in the open access fishery can be found in the Pacific Coast Groundfish Fishery Management Plan, Essential Fish Habitat Designation and Minimization of Adverse Impacts, Draft EIS, prepared in February 2005. This DEIS also describes the physical impacts on the environment under status quo management.

One of the major benefits of VMS is its deterrent effect. VMS is expected to have a beneficial deterrent effect (the reduction in illegal fishing in closed areas when fishing vessel operators know that they are being monitored) by reducing the likelihood of unforeseen effects on the physical environment resulting from unknown illegal fishing in the RCAs. It has been demonstrated that if fishing vessel operators know that they are being monitored and that a credible enforcement action will result from illegal activity, then the likelihood of that illegal activity occurring is significantly diminished. In this context, VMS is a preventive measure that may reduce potential violations of areas that are closed for habitat protection.

At this time, there are no areas in federal waters specifically closed to protect groundfish habitat from fishing gear impacts. However, proposals for such areas are currently being considered. Further discussion on the proposed groundfish habitat areas can be found in the Pacific Coast Groundfish Fishery Management Plan, Essential Fish Habitat Designation and Minimization of Adverse Impacts, Draft EIS, prepared in February 2005. This DEIS also describes the physical impacts on the environment under status quo management.

Indirect impacts from fishery management actions include changes in fishing practices that affect the physical environment, but are further away in time or location than those occurring as a direct impact. Area management involves closing and sometimes opening areas formerly closed to specific open access fishing gear groups. When the size or location of closed areas change, the fishing fleet makes shifts in fishing effort. Understanding the nature of effort shifts, especially understanding where the effort shifts to (and the habitat types most common in these areas) and where the effort shifts from (and the habitat types most common in these areas), is critical to understanding how management actions will likely increase or decrease beneficial and adverse impacts to habitat.

VMS is expected to provide data that can be used in combination with data on fishing gear impacts and habitat to better understand effort shifts and the potential effects on the physical environment. Therefore, VMS provides an indirect benefit to the physical environment. The amount of information available for assessing the impacts of fishing effort on the physical environment varies under each of the alternatives. Therefore, the indirect effects vary between the alternatives and depend on the proportion of the fleet that is required to carry VMS and provide declaration reports as well as the potential impacts associated with a particular gear type.

Comparison of the Alternatives

Alternative 1, Status Quo, would continue the requirement for declaration reports from open access vessels using exempted trawl gear in the RCAs. Under Alternative 1, open access fishery position data

would be available from vessels who voluntarily use VMS units and from vessels that fish pursuant to the open access regulations, but carry VMS because the vessel is registered to a limited entry permit. Section 3.3 of the EIS, for the Proposed Acceptable Biological Catch and Optimum Yield Specifications and Management Measures for the 2005-2006 Pacific Coast Groundfish fishery addressed the physical impacts on the environment under status quo management. In addition, the Pacific Coast Groundfish Fishery Management Plan, Essential Fish Habitat Designation and Minimization of Adverse Impacts, Draft EIS, prepared in February 2005 also describes the physical impacts on the environment under status quo management.

Alternative 2 maintains the declaration provisions of status quo, but adds the VMS and declaration reporting requirements for approximately 165 vessels (131 directed groundfish, 31 Pacific halibut, California halibut, and 2 HMS) vessels using longline gear to take and retain, possess or land groundfish. Of the alternatives that require VMS, Alternative 2 would provide the least amount of data for monitoring areas established for habitat protection or for assessing fishing effort and intensity relative to fishing fleet activity. This is because Alternative 2 would require the smallest proportion of the open access fleet (only vessels using longline gear) to have and use VMS. Given the mobility of vessels within the fishery, directed longline vessels could change gears to avoid the VMS requirements. Alternative 3, includes the same vessels as Alternative 2, but adds the VMS and declaration reporting requirements for approximately 128 vessels (30 directed, 45 Dungeness crab, 8 prawn, 8 CA sheephead, and 37 CA halibut vessels) using pot gear to take and retain, possess or land groundfish. Similar to Alternative 2, some vessels may change to line gear to avoid the VMS requirement. Alternative 3 would provide more data than Alternative 2, however it would provide less data than Alternative 4, which includes the same vessels as Alternative 3, but adds the VMS and declaration reporting requirement for approximately 41 vessels (18 ridgeback prawn, 6 sea cucumber and 17 California halibut vessels) using exempted trawl gear that take and retain, possess or land groundfish.

Alternative 5A includes the same vessels as Alternative 4, but adds the VMS and declaration reporting requirements for approximately 738 groundfish, 105 California halibut, and 12 HMS vessels using line gear to take and retain, possess or land groundfish. Alternative 5B, includes slightly more vessels than 5A because the number of salmon troll vessels (177 vessels) that would be added under this alternative is greater than the number of HMS (12 line and 2 longline vessels) and Dungeness crab (45 vessels) vessels that would be excluded. Though Alternative 5B does not include vessels in fisheries that are projected to have minimal impacts on overfished species, it does include salmon troll vessels. Alternative 6A, which applies to any vessel engaged in commercial fishing to which a RCA restriction applies, includes the largest number of open access vessels (1,423) and would therefore provide the largest amount of data for monitoring habitat protection areas or for assessing fishing effort and intensity relative to fishing fleet activity. Unlike Alternatives 4-5B, all 80 exempted trawl vessels would be included under Alternative 6A, not just those that take and retain, possess or land groundfish. Because the trawl sector is believed to have a greater fishing gear impact on the physical environment, Alternatives 6A- 7 which include all 80 trawl vessels, would be much more beneficial than the Alternatives 4-5B that include only a portion of the trawl vessels (41 vessels). There is no difference in trawl data availability between Alternatives 6A, 6B and 7. Alternative 6B, is essentially the same as Alternative 6A, but affects approximately >134 vessels, all of which use salmon troll gear. Alternative 7, is essentially the same as Alternative 6A because it applies to all the same vessels except those vessels less than 12 feet in length. Vessels under 12 feet in length are not expected to fish in Federal waters and would therefore not be required to have VMS.

The open access fishery does not require participants to have permits or gear endorsements. Directed groundfish participants using fixed gear have the mobility to choose between the legal open access fixed gears for harvesting groundfish. Therefore, if VMS requirements under Alternative 2 or 3 were implemented, it will likely result in some directed groundfish participants changing gear to avoid the VMS requirements. Because a substantial proportion of the fleet is required to use VMS under Alternatives 4-7, the number of directed groundfish vessel operators that are likely to change gear to avoid VMS requirements is reduced. Vessels that incidentally catch groundfish while targeting other species are less

likely to change gears to avoid VMS requirements. This is because the various state and federal requirements for the target fishery they are participating in generally restricts the type of gear participants can use. However, participants that catch groundfish incidentally are not considered to be in the open access groundfish fishery unless they take and retain, possess or land groundfish. Therefore, these participants may choose to avoid the VMS requirements by not retaining groundfish, though they would continue to catch groundfish incidentally to the target fishery. The number of participants that would choose to discard groundfish to avoid VMS requirements is unknown; however, a substantial number of participants making less than \$1000 of exvessel revenue per year from groundfish would likely avoid VMS requirements.

4.2 Biological Impacts

BIOLOGICAL ENVIRONMENT - COMPARISON OF THE ALTERNATIVES	
TOTAL CATCH	Changes in groundfish mortality levels as a result of VMS regulations
Alternative 1 Status quo	<p><u>Direct impacts</u> A higher level of fishing mortality than those being used to estimate total catch, may affect the integrity of closed areas if incursions result in higher rates of overfished species catch than projected.</p> <p><u>Indirect impacts</u> Little specific information on fishing location is available from the OA fleet for understanding impacts of effort shifts on adult and juvenile populations, or for refining overfished species total catch estimates. Declaration reports may be used to estimate the number of vessels/trips in conservation areas by exempted trawl vessels.</p>
Alternative 2 Vessels using longline gear	<p><u>Direct impacts</u> Allows the integrity of nontrawl RCAs to be maintained in relation to 165 vessels using longline gear to take and retain, possess or land OA groundfish (approximately 131 directed groundfish, 31 Pacific halibut, 1 CA halibut, and 2 HMS vessels). The risk of actual catch exceeding the OYs for overfished species is reduced for directed groundfish and Pacific halibut longline vessels that take and retain, possess or land groundfish. No change over Alt.1 for HMS longline vessels because they are not projected to catch overfished species.</p> <p><u>Indirect impacts</u> Fishing effort and location data could improve manager's understanding of groundfish mortality by approximately 165 vessels (131 directed groundfish, 31 Pacific halibut, and 2 HMS vessels) using longline gear to take and retain, possess or land groundfish. Data can be combined with observer, survey, and fish ticket data to better estimate: 1) total fishing mortality, 2) impacts on juveniles and other fishery resources related to changes in fishing locations and intensity, 3) data on fishing intensity (amount of time vessels are in an area) would be available, and 4) changes in fishing location and intensity over time.</p>
Alternative 3 Vessels using longline or pot gear	<p>In addition to impacts identified under Alt. 2:</p> <p><u>Direct impacts</u> Improves ability to maintain integrity of nontrawl RCAs in relation to 128 vessels using pot gear that take and retain, possess or OA land groundfish (30 directed, 45 Dungeness crab, 8 prawn, 8 CA sheephead, and 37 CA halibut vessels). The risk of actual catch exceeding the OYs for overfished species is reduced for directed groundfish pot and prawn vessels. No change over Alt.1 for Dungeness crab vessels because no overfished species catch is projected.</p> <p><u>Indirect impacts</u> Fishing effort and location data from approximately 128 vessels could improve manager's understanding of groundfish mortality for pot vessels in the same ways as identified under Alt. 2 for longline vessels.</p>
Alternative 4 Vessels using longline, pot or trawl gear, except: pink shrimp trawl	<p>In addition to impacts identified under Alt. 2 & Alt. 3:</p> <p><u>Direct impacts</u> Adds the ability to maintain the integrity of nontrawl RCAs in relation to 41 vessels using exempted trawl gear to take and retain, possess or land groundfish (approximately 18 ridgeback prawn, 6 sea cucumber and 17 California halibut vessels). The risk of actual catch exceeding the OYs for overfished species is reduced for exempted trawl vessels.</p> <p><u>Indirect impacts</u> Fishing effort and location data from approximately 41 vessels (18 ridgeback prawn, 6 sea cucumber and 17 California halibut vessels) could improve manager's understanding of groundfish mortality for trawl vessels in the same ways as identified under Alt. 2 for longline vessels.</p>

<p>Alternative 5A Vessels using longline, pot, trawl or line gear, except: pink shrimp trawl and salmon troll</p>	<p>In addition to impacts identified under Alt. 2, 3, and 4:</p> <p><u>Direct impacts</u> Improves the ability to maintain integrity of nontrawl RCAs in relation to vessels using line gear that take and retain, possess or land OA groundfish . The risk of actual catch exceeding overfished species OYs is reduced for directed groundfish vessels. No change over Alt. 1 for HMS line vessels because they are not projected to catch overfished species. Impacts on overfished species taken incidentally is neutral because they are expected to be encountered with or without VMS. However, VMS would likely deter mixed fishing strategies where vessels alter gear to catch groundfish within the RCAs.</p> <p><u>Indirect impacts</u> Fishing effort and location data available from approximately 738 vessels groundfish, 105 California halibut, and 12 HMS vessels could improve managers understanding of groundfish mortality for line vessels in the same ways as identified under Alt. 2 for longline vessels.</p>
<p>Alternative 5B Vessels using longline, pot, trawl or line gear, except: pink shrimp trawl, HMS longline and line, and Dungeness crab pot gear</p>	<p><u>Direct impacts</u> Adds the ability to maintain the integrity of gear nontrawl RCAs in relation to: 163 vessels using longline gear as identified under Alt. 2 (excluding 2 HMS vessels are excluded); 83 vessels using pot gear as identified under Alt.3. (excluding 45 Dungeness crab vessels); 41 vessels using trawl gear as identified under Alt.4, and vessels using line gear as identified under Alt. 5A (plus 177 salmon troll vessels coastwide) that take and retain, possess or land OA groundfish. No change over Alt.1 for HMS or Dungeness crab vessels because they are not projected to catch overfished species. Because canary rockfish, lingcod, bocaccio, and yelloweye rockfish are vulnerable to salmon troll gear, maintaining the integrity of the RCAs in relation to targeted groundfish fishing by salmon troll vessels would be beneficial. Impacts on incidentally taken overfished species is neutral because they would be encountered with or without VMS. However, VMS would likely deter fishing strategies where vessels alter their gear to catch more groundfish within the RCAs.</p> <p><u>Indirect impacts</u> Fishing effort and location relative to areas where overfished species are distributed would be available from vessels identified under Alt. 2, 3, 4 and 5A, except that vessels using Dungeness crab pot, HMS longline and HMS line gear would be excluded, but approximately 177 salmon troll vessels would be included. VMS data could improve manager's understanding of groundfish mortality in the same ways as identified under Alt. 2 for longline vessels.</p>
<p>Alternative 6A Vessels with RCA restrictions; except pink shrimp trawl</p>	<p><u>Direct impacts</u> In addition to benefits identified under Alt. 2, 3, 4, and 5A, adds the ability to maintain the integrity of nontrawl RCAs in relation to all vessels with RCA requirements (pink shrimp vessels are excluded). Includes data from: 165 vessels using longline gear as identified under Alt. 2 except that all 49 Pacific halibut vessels are included; 128 vessels using pot gear identified under Alt. 3; all 80 vessels using trawl gear (approximately 32 ridgeback prawn, 14 Sea cucumber, and 34 California halibut vessels); 1,032 vessels using line gear as identified under Alt. 5B (includes salmon troll coastwide) to take and retain, possess or land OA groundfish; vessels using net gear (approximately 3 CPS vessels); and vessels using other OA gears (approximately 4 vessels). Because canary rockfish, lingcod, bocaccio, and yelloweye rockfish are vulnerable to salmon troll gear, maintaining the integrity of the RCAs in relation to targeted groundfish fishing in the RCAs by salmon troll vessels would be beneficial. In 2005, salmon troll vessels are projected to encounter 1.6 mt or 52 percent of the canary rockfish taken in all open access fisheries. Impacts on incidentally taken overfished species within the RCAs is neutral because they would be encountered with or without VMS. VMS would likely deter mixed fishing strategies where vessels alter their gear to catch more groundfish in the RCAs. No change over Alt. 1 for HMS line and sea cucumber vessels because they are not projected to catch overfished species</p> <p><u>Indirect impacts</u> In addition to benefits identified under Alt. 2, 3, 4, and 5, adds the ability to maintain the integrity of nontrawl RCAs in relation to all vessels with RCA requirements (pink shrimp vessels are excluded). Total of approximately 1,423 vessels.</p>

<p>Alternative 6B Vessels with RCA restrictions: except salmon troll north that retain only yellowtail rockfish and pink shrimp trawl</p>	<p><u>Direct impacts</u> The ability to maintain the integrity of the RCAs is slightly less than those identified under Alt. 6A, because salmon troll vessels fishing north of 40°10' N. lat. that only land yellowtail rockfish would be excluded.</p> <p><u>Indirect impacts</u> Increased data on fishing effort is slightly less than those identified under Alt. 6A, because salmon troll vessels fishing north of 40°10' N. lat. that only land yellowtail rockfish would be excluded.</p>
<p>Alternative 7 Vessel >12 ft with RCA restriction; except, pink shrimp trawl</p>	<p><u>Direct impacts</u> The ability to maintain the integrity of the RCA is slightly less than those identified under Alt. 6A because approximately 22 vessels (those <12 feet in length) less than that identified under Alt. 6A are excluded. Few if any of these vessels are likely to fish in Federal waters.</p> <p><u>Indirect impacts</u> Increased data on fishing effort is slightly less than that identified under Alt. 6A; approximately 22 vessels (those <12 feet in length) less than those identified under Alt. 6A are excluded. Few if any of these vessels are likely to fish in Federal waters.</p>

4.2.1 Fishing mortality

Direct impacts on fishing mortality include changes in the mortality of target and non-target species (incidental catch). This action would expand the VMS program to the open access gear sectors to monitor fishing location in relation to time-area closures. Direct benefits result if the integrity of RCAs are maintained as a result of VMS requirements.

To monitor the attainment of OYs, the total catch level must be estimated for each species or species group. The fishing mortality level (total catch level) for each species is the sum of retained catch and discarded catch (incidental or targeted catch that is not retained and landed by the vessel). There is no exact measure of discard amounts in the open access fisheries. For all species except lingcod, sablefish, and nearshore rockfish species, it is assumed that discarded fish are dead or die soon after being returned to the sea. Total catch estimates of overfished species in the limited entry fisheries are currently based a bycatch accounting model (for further information on current bycatch model see the preamble discussion in the proposed rules for the Harvest Specifications and Management Measures from 2003, 2004 and 2005-2006; January 7, 2003, 68 FR 936) which has applied depth-related discard assumptions since 2003. At this time, total catch estimates of overfished species taken in the open access fishery are based on landed catch from fish tickets, assumed discard rates, discard and discard mortality assumptions, expertise from state fisheries managers, and industry advisory body input. However, as observer and other data become available more formal bycatch modeling is expected to be used for a portion (directed) or perhaps all of the open access fisheries. The current bycatch model for the limited entry fisheries uses overfished species bycatch rates that are representative of fishing outside the RCAs, and would be higher if areas within the RCAs were included. An open access fishery bycatch model would likely be similar for the directed open access fisheries.

Discard assumptions used for modeling the fishery to estimate total catch of overfished species have been based on bycatch rates for areas where fishing is expected to occur. Thus, higher total mortality than assumed by the model could result if the integrity of the closed areas were not adequately maintained. This is especially a concern for those overfished species that constrain the fisheries and for which the OY is fully attained each fishing year. If incursions into the RCAs occur, the estimated total mortality would likely be underestimated and the risk of exceeding the OYs for overfished species increased, with the risk being greatest for species most frequently encountered by the open access gears (bocaccio, lingcod, yelloweye rockfish and canary rockfish), which the closed areas are intended to protect. If the true discard rates are higher than the discard assumptions used to estimate total catch, the OYs could unknowingly be exceeded. If the OYs are substantially exceeded, a stock's ability to rebuild could be impaired. If a rebuilding deficit is created for an overfished stock because the OY is repeatedly unknowingly exceeded, the stock may not be able to recover within the specified rebuilding time. For stocks in the precautionary zone (B25%-B40%), the stock biomass could be further reduced, possibly leading to an overfished status.

Indirect impacts from fishery management actions include changes in fishing practices that affect the biological environment, but are further away in time or location than those occurring as a direct impact. The prohibition of fishing in certain areas or during certain times is used to reduce overall fishing effort and to protect vulnerable populations. When depth-based RCA management was adopted, large areas of the continental shelf were closed to groundfish fishing to protect overfished species. This was expected to result in effort shifts to open areas that are shoreward and seaward of the conservation areas. Overtime, area management involves closing and sometimes opening formerly closed areas. When the size or location of closed areas change, the fishing fleet makes shifts in fishing effort. Knowing when and where fishing is occurring is necessary: for understanding total fishing mortality; evaluating possible impacts on the adult and juvenile groundfish species; assessing impacts with non-groundfish species; and determining if regulatory changes are needed.

Commercial data is primarily in the form of landing receipts or "fish tickets," which are filled out by fish buyers at the time of delivery from a fishermen. Fish tickets are a major source of information on the amount of fish and which provide information on the total weight landed by species or market categories, price per pound, and the condition of the catch. Little specific information on fishing locations is available for the open access fleet. Therefore, little is known about fishing patterns in the West Coast groundfish

open access fishery or how fishing effort shifts from closed areas to the remaining open fishing areas.

Logbooks are a useful tool for verifying landing receipts and for tracking fishing activity. The information recorded in logbooks typically consists of date, boat name and identification number, crew size, catch location, numbers or pounds of fish, gear type used, mesh size, principle target species, associated species taken and landing receipt number. Logbook data is not available from the directed open access fisheries at this time, but are for a few incidental fisheries such as the California gill and trammel nets, traps, and trawl gear fisheries. Without effort data, estimates of catch per unit of effort (CPUE) cannot be made. CPUE is the number or weight of fish caught per unit of effort. Typically, effort evaluated by gear type, gear size, and length of time the gear is used. CPUE can be used as a measure of relative abundance for a particular species and can be used to understand abundance changes over time. VMS can aid in estimating CPUE based on fishing location and days at sea.

VMS systems provide accurate harvest location data that could be used to estimate the distribution of fishing effort throughout the WOC. Hourly position reports allow changes in fishing location and intensity to be monitored and assessed, it also allows the number of vessel trips to be verified. Because VMS would be required to be operated continuously after a vessel fishes in the open access fishery in Federal waters, data from additional non-groundfish fisheries off the West Coast may also be available. When VMS position information can be combined with data collected by at-sea observers and used to better understand the impacts of the effort shift on adult and juvenile populations. Overfished species bycatch estimates may be refined with VMS data. The response time for management to address unintended impacts on stocks resulting from effort shifts could be improved with VMS. However, the ability to understand the extent of the impacts resulting from effort shifts on groundfish and other resources would depend on the amount, availability and applicability of other data such as at-sea observer data for the different gears and sectors of the open access fishery.

Comparison of the Alternatives The level of fleet coverage, that portion of the overall open access fishing fleet that would be required to have VMS and provide declaration reports, is the only difference between the alternatives. Alternative 1, Status Quo, would continue the requirement for declaration reports from open access vessels using exempted trawl gear in the RCAs. Under Alternative 1, a higher level of fishing mortality than that being used to estimate total catch, may result if the integrity of closed areas are not maintained and incursions result in higher rates of overfished species than projected. The difficulty in maintaining the integrity of closed areas are greatest under status quo, Alternative 1. Alternative 2 maintains the provisions of status quo, but adds the VMS and declaration reporting requirements for approximately 131 directed groundfish, 31 Pacific halibut, and 2 HMS vessels using longline gear to take or retain, possess or land OA groundfish. Of the alternatives that require VMS, Alternative 2 requires the smallest proportion of the open access fleet (only vessels using longline gear) to have and use VMS. Alternative 3, includes the same vessels as Alternative 2, but adds the VMS and declaration reporting requirements for approximately 128 vessels (30 directed, 45 Dungeness crab, 8 prawn, 8 CA sheephead, and 37 CA halibut vessels) vessels using pot gear to take or retain, possess or land OA groundfish. Therefore, Alternative 3 would provide more data than Alternative 2, however it would provide less data than Alternative 4.

Alternative 4 includes the same vessels as Alternative 3, but adds the VMS and declaration reporting requirement for approximately 18 ridgeback prawn, 6 sea cucumber and 17 California halibut vessels using exempted trawl gear (excludes pink shrimp vessels) to take or retain, possess or land OA groundfish. Alternative 5A includes the same vessels as Alternative 4, but adds the VMS and declaration reporting requirements for approximately 1,032 vessels (738 groundfish, 105 California halibut, and 12 HMS vessels) using line gear to take and retain, possess or land groundfish (excludes salmon troll vessels). Alternative 5B, includes slightly more vessels (1,307 vessels) than 5A (1,189 vessels) because the number of salmon troll vessels that would be added under this alternative is greater than the number of HMS and Dungeness crab vessels that would not be included. Though alternative 5B does not include vessels in fisheries that are projected to have minimal impacts on overfished species (12 HMS line and 2 longline, 45 Dungeness crab pot), it includes the approximately 241 salmon troll vessels that take or retain, possess or land OA groundfish. Alternative 6, which applies to any vessel engaged in commercial fishing to which a RCA restriction applies, includes the largest number of open access vessels. Therefore Alternative 6 would provide the largest amount of data for assessing fishing effort and intensity relative to

fishing fleet activity. Alternative 6B affects approximately 79 fewer vessels annually than does Alternative 6A, all of which use salmon troll gear. Alternative 7, is almost the same as Alternative 6A because it applies to the same vessels except that vessels less than 12 feet in length would be excluded. Most, if not all, vessels under 12 feet in length are unlikely to fish in Federal waters and would therefore not trigger the VMS requirement.

Table 3.3.3.7 shows the projected catch of overfished species impacts for 2005 for the open access directed groundfish incidental fisheries. The proportion of all open access catch projected to be taken by the open access directed fisheries together is 89 percent of the bocaccio; 32 percent of the canary rockfish; 100 percent of the cowcod, pop, and darkblotched rockfish; 97 percent of the lingcod, 43 percent of the yelloweye rockfish, and 0 percent of the widow rockfish. On average between 2000 and 2003, directed longline vessels took approximately 425 mt of groundfish as compared to 157 mt taken by directed vessels using pot gear and 385 mt taken by vessels using line gear. Alternatives 2 and 3 each cover only a portion of the open access directed gears, leaving vessels using line gear to take and retain, possess or land groundfish without VMS coverage. Mobility in the fishery between directed gears could result in fishers shifting gears types to avoid VMS coverage, leaving less data available for estimating total catch and understanding shifts in fishing effort and intensity. Alternative 5A provides coverage to those sectors that catch the largest proportion of groundfish and prevents directed fishers from changing gears to avoid the VMS requirements.

Alternative 6A and 7 provide the most amount of information on fishing locations for the greatest number of participants, followed by 6B and then 5B. The integrity of the RCAs can be best maintained with these alternatives, because they provide coverage for the sectors that are projected to have the greatest impact on overfished species, reduce the ability of fishers to use alternative gears to avoid the VMS requirements, and reduce the incentive for salmon troll vessels to use their gear in a way that would increase groundfish bycatch in the RCAs. In 2005, salmon troll vessels are projected to encounter 1.6 mt or 52 percent of the canary rockfish taken in all open access fisheries. Alternatives 6A, 7 and 5B are similar in that all salmon troll vessels that take and retain, possess or land groundfish would be required to have and use VMS. Because alternative 6B does not require VMS for salmon vessels north of 40° 10' N. lat. that only land yellowtail rockfish, there are slightly fewer benefits than Alternatives 6A, 7 and 5B. Alternative 5B covers fewer vessels than Alternatives 6A or 7 because it excludes all 14 HMS, all 45 Dungeness crab, and 39 exempted trawl vessels (other than pink shrimp) that do not retain groundfish. There is no projected catch of overfished species for the HMS or Dungeness crab vessels, and the projected catch of overfished species by the exempted trawl fisheries is 0.1 mt of bocaccio, 1 percent of the catch in all open access fisheries. However, an unknown amount of small lingcod may be taken in Dungeness crab pots. When handled gently and immediately returned to the sea, lingcod have a strong chance of surviving capture. Therefore, the increased benefits from the availability of data for estimating total catch and monitoring the attainment of overfished species OYs resulting from Alternatives 6A and 7 over alternative 5B is minimal. The benefits of position data availability should be considered in the longer term because there is currently very little data (observer or otherwise) from open access vessels on the amounts and types of bycatch in their fisheries. In the short-term, using effort data obtained from a VMS system to estimate total catch and to monitor the attainment of OYs will be limited until more data becomes available.

4.2.2 Other Resources

Non-groundfish species interactions

The action is to expand the VMS program to monitor the integrity of closed areas in relation to open access fishing activities. None of the management alternatives is expected to have an adverse effect on the incidental mortality levels of CPS, Dungeness crab, Pacific pink shrimp, Pacific halibut, forage fish or miscellaneous species over what has been considered in previous NEPA analyses. Information on where fishing effort is occurring (Alternatives 2- 7) may be positive because it may allow NMFS observer data and data from other sources to be joined together to derive a better understand of potential fishing related impacts on these species.

Salmonids

The action is to expand the VMS program to monitor the integrity of closed areas in relation to open access fishing activities. None of the management alternatives is expected to have an adverse effect on the incidental mortality levels of listed salmon species over what has been considered in previous NEPA analyses. Information on where fishing effort is occurring (Alternatives 3- 7) may have a positive effect because it could be joined with NMFS observer data and data from other sources to derive a better understand of potential fishing related impacts on these species.

Marine Mammals

The action is to expand the VMS program to monitor the integrity of closed areas in relation to open access fishing activities. The West Coast groundfish fisheries are considered Category III fisheries, where the annual mortality and serious injury of a stock by the fishery is less than or equal to 1% of the PBR level (potential biological removal). Information on where fishing effort is occurring (Alternatives 3- 7) may have a positive effect because it could be joined with NMFS observer data and data from other sources to derive a better understand of potential fishing related impacts on these species.

Seabirds

The action is to expand the VMS program to monitor the integrity of closed areas in relation to open access fishing activities. None of the proposed management alternatives are likely to affect the incidental mortality levels of seabirds over what has been considered in previous NEPA analyses. Information on where fishing effort is occurring (Alternatives 3- 7) may have a positive effect because it could be joined with NMFS observer data and data from other sources to derive a better understand of potential fishing related impacts on these species.

Sea Turtles

The action is to expand the VMS program to monitor the integrity of closed areas in relation to open access fishing activities. None of the proposed management alternatives are likely to affect the incidental mortality levels of sea turtles over what has been considered in previous NEPA analyses. Information on where fishing effort is occurring (Alternatives 3- 7) may have a positive effect because it could be joined with NMFS observer data and data from other sources to derive a better understand of potential fishing related impacts on these species.

Endangered Species

Species listed under the ESA are identified in Section 3.2 of this EA. Specific discussion of species listed under the ESA can be found above in the sections titled salmonids, marine mammals, sea birds and sea turtles.

4.3 Socio-economic Impacts

SOCIO-ECONOMIC ENVIRONMENT - COMPARISON OF THE ALTERNATIVES	
FISHERY ENFORCEMENT	Changes in the ability to enforce groundfish fishery regulations as a result of VMS regulations
Alternative 1 Status quo	<u>Direct impact</u> Declaration reports may aid in identifying OA trawl vessels legally fishing in conservation areas.
Alternative 2 Vessels using longline gear	<p><u>Direct impact</u> Accurate and timely position data will allow enforcement resources to be used efficiently to maintain the integrity of RCAs in relation to approximately 165 vessels (131 directed groundfish, 31 Pacific halibut, 1 CA halibut, and 2 HMS longline vessels) that take and retain, possess or land OA groundfish. Deterrent effect will likely reduce the number of area violations by vessels using OA longline gear. Can be used to target at-sea and dockside inspections of OA vessels using longline gear.</p> <p><u>Indirect impact</u> VMS position data from 165 longline vessels: may be used as basis for enforcement actions; may be used to establish probable cause for investigations; may be beneficial to homeland security activities, and; may be used to support enforcement actions for closed area management in the Pacific Halibut directed fishery.</p>
Alternative 3 Vessels using longline or pot gear	<p>In addition to impacts under Alt. 2:</p> <p><u>Direct impact</u> Accurate and timely position data will allow enforcement resources to be used efficiently to maintain the integrity of RCAs in relationship to approximately 128 vessels (30 directed, 45 Dungeness crab, 8 prawn, 8 CA sheephead, and 37 CA halibut vessels) vessels using pot gear that take and retain, possess or land groundfish. Deterrent effect will likely reduce the number of area violations by vessels using OA pot gear. Can be used to target at-sea and dockside inspections of OA vessels using pot gear.</p> <p><u>Indirect impact</u> VMS position data from 165 longline and 128 pot vessels: may be used as basis for enforcement actions; may be used to establish probable cause for investigations; may be beneficial to homeland security activities, and; may be used to support enforcement actions for closed area management in the Dungeness crab and spot prawn pot fisheries.</p>

<p>Alternative 4 Vessels using longline, pot or trawl gear, except: pink shrimp trawl</p>	<p>In addition to impacts under Alt. 2 and 3:</p> <p><u>Direct impact</u> Accurate and timely position data allow enforcement resources to be used efficiently to maintain the integrity of RCAs in relation to approximately 41 vessels (18 ridgeback prawn, 6 sea cucumber and 17 CA halibut vessels) using exempted trawl gear to take and retain, possess or land OA groundfish. Deterrent effect will likely reduce the number of area violations by vessels using exempted trawl gear. Can be used to target at-sea and dockside inspections of OA vessels using exempted trawl gear.</p> <p><u>Indirect impact</u> VMS position data from 165 longline, 128 pot, and 41 trawl (except shrimp trawl) vessels: may be used as basis for enforcement actions; may be used to establish probable cause for investigations; may be beneficial to homeland security activities, and; may be used to support enforcement actions for closed area management in the ridgeback prawn, sea cucumber, and CA halibut fisheries excluding pink shrimp.</p>
<p>Alternative 5A Vessels using longline, pot, trawl or line gear, except: pink shrimp trawl and salmon troll</p>	<p>In addition to impacts under Alt. 2, 3 and 4,</p> <p><u>Direct impact</u> Accurate and timely position data will allow enforcement resources to be used efficiently to maintain the integrity of RCAs in relation to approximately 855 (738 vessels using line gear to target groundfish, 12 HMS, and 105 CA halibut OA vessels) using line gear to take and retain, possess or land groundfish. Deterrent effect will likely reduce the number of area violations by vessels using line gear. Can be used to target at-sea and dockside inspections for OA vessels using line gear.</p> <p><u>Indirect impact</u> VMS position data from 165 longline, 128 pot, 41 trawl (except shrimp trawl), and 855 line (except salmon troll) vessels: may be used as basis for enforcement actions; may be used to establish probable cause for investigations; may be beneficial to homeland security activities; and may be used for closed area management in the line fisheries excluding salmon troll.</p>
<p>Alternative 5B Vessels using longline, pot, trawl or line gear, except: pink shrimp trawl, HMS longline, HMS line, and Dungeness crab pot gear</p>	<p><u>Direct impact</u> Accurate and timely position data will allow enforcement resources to be used efficiently to maintain the integrity of RCAs in relation to vessels using longline gear as identified under Alt. 2 (excluding 2 HMS vessels); 83 vessels using pot gear as identified under Alt.3. (excluding 45 Dungeness crab vessels); 41 vessels using trawl gear as identified under Alt.4, and 1,020 vessels using line gear as identified under Alt. 5A (plus 177 salmon troll vessels coastwide) that take and retain, possess or land OA groundfish. Deterrent effect will likely reduce the number of area violations for incidental OA fisheries including salmon fishery area management measures. Can be used to target at-sea and dockside inspections for OA vessels</p> <p><u>Indirect impact</u> VMS position data from 163 longline (excludes 2 HSM vessels), 83 pot (excludes 45 Dungeness crab vessels), 41 trawl (excludes shrimp trawl), and 1,020 line (includes 177 salmon troll vessels but excludes 12 HMS vessels), may be used as basis for enforcement actions; may be used to establish probable cause for investigations; may be beneficial to homeland security activities; and; may be used for closed area management in the in OA incidental fisheries excluding pink shrimp, HMS longline, HMS line and Dungeness crab pot fisheries, but including salmon troll.</p>

<p>Alternative 6A Vessels with RCA restrictions; except pink shrimp trawl</p>	<p><u>Direct impact</u> Accurate and timely position data availability Will allow enforcement resources to be used efficiently to maintain the integrity of RCAs in relation to all vessels with RCA requirements (excluding pink shrimp vessels). Includes data from: 214 vessels using longline gear as identified under Alt. 2 except that all 49 Pacific halibut vessels are included; 128 vessels using pot gear identified under Alt. 3; all 80 vessels using trawl gear (approximately 18 ridgeback prawn, 14 Sea cucumber, and 34 California halibut vessels); 1,032 vessels using line gear as identified under Alt. 5B (includes salmon troll coastwide) to take and retain, possess or land OA groundfish; 3 vessels using net gear (approximately 3 CPS vessels); and 4 vessels using other OA gears. Deterrent effect will likely reduce the number of area violations for OA incidental fisheries including the salmon fishery. Can be used to target at-sea and dockside inspections for all OA vessels with RCA restrictions, including salmon troll coastwide.</p> <p><u>Indirect impact</u> VMS position data from 214 longline, 128 pot, 80 trawl (excludes shrimp trawl), and 1,032 line (includes 177 salmon troll vessels but excludes 12 HMS vessels) vessels: may be used as basis for enforcement actions; may be used to establish probable cause for investigations; may be beneficial to homeland security activities; and; may be used for closed area management in the in OA incidental fisheries with RCA restrictions, including salmon troll.</p>
<p>Alternative 6B Vessels with RCA restrictions: except salmon troll north that retain only yellowtail rockfish and pink shrimp trawl</p>	<p><u>Direct impact</u> Slightly less accurate and timely position data than identified under Alt. 6A, because salmon troll vessels fishing north of 40°10' N. lat. that only land yellowtail rockfish would be excluded</p> <p><u>Indirect impact</u> VMS position data from 214 longline, 128 pot, 80 trawl (excludes shrimp trawl), and >898 line (excludes salmon troll North though some land groundfish other than yellowtail) vessels: may be used as basis for enforcement actions; may be used to establish probable cause for investigations; may be beneficial to homeland security activities; and; may be used for closed area management in the in OA incidental fisheries with RCA restrictions.</p>
<p>Alternative 7 Vessel >12 ft with RCA restriction; except, pink shrimp trawl</p>	<p><u>Direct impact</u> Slightly less accurate and timely position data than identified under Alt. 6A because approximately 22 vessels (6 longline, 2 pot, and 14 line gear vessels <12 feet in length) fewer vessels (1,383 vessels) than those identified under Alt. 6A are excluded. Few if any of these vessels fish in Federal waters.</p> <p><u>Indirect impact</u> VMS position data from 214 longline, 120 pot, 80 trawl (excludes shrimp trawl), and 1,018 line (includes 177salmon troll vessels) vessels: may be used as basis for enforcement actions; may be used to establish probable cause for investigations; may be beneficial to homeland security activities; and; may be used for closed area management in the in OA incidental fisheries with RCA restrictions.</p>

4.3 Socio-economic Impacts

This section of the EA looks at impacts, positive and negative, on the socio-economic environment. Basic information regarding the people and the fisheries that are projected to be affected by the management alternatives was presented in Section 3 of this document. The following section differs in that it discusses what is projected to happen to the affected people, what social changes are expected to occur, and, how changes are expected to affect fishing communities. Changes in harvest availability to the different sectors of the fishery, changes in income and revenue, costs to participants; the effectiveness and costs of enforcing the management measures, effects on fishing communities, and how the actions affect safety of human life at sea will be examined in the following impact analysis.

Circumstances vary substantially between open access target fisheries and gear groups. In addition, little social and economic information is available on the various open access fisheries and the participants. Therefore, it is not possible to produce a detailed cost benefit study for VMS implementation in the open access fishery. The following analysis takes a general approach by examining; the costs and benefits to the open access fishery participants that are likely to result from the alternative VMS actions relative to economic status of the fishery participants; the ecological health of the resources; the geographical nature of the fishery; the type of fishing conducted (directed or incidental); the type of gear used; the quantity and size of vessels; fisheries enforcement; the management regime; and safety of human life at-sea.

4.3.1 Fishery Enforcement

Direct impacts on enforcement from fishery management actions includes; changes in the availability of information that directly aids enforcement officers in identifying violations; changes in information that helps enforcement officers to separate those individuals who are complying with the regulatory requirements from those who are not; and changes that alter the level of compliance by fishers.

At the present time there are 8 NMFS agents covering the Pacific Coast groundfish fishery. These officers and agents are responsible for enforcing all conservation regulations in the Pacific Coast groundfish fishery (e.g. size limits, trip limits, gear restrictions, etc). They are also responsible for monitoring all other fisheries in areas that are regulated by NMFS. In addition, there are state enforcement officers in California, Oregon, and for Washington that cover the groundfish fishery as well as other state fisheries. At this time, state enforcement resources (personnel and budgets) are extremely limited.

Implementing depth-based management measures over large geographic areas marked the transition to a much greater dependence upon at-sea enforcement. Maintaining the integrity of the conservation areas is largely dependent upon the ability to enforce such management measures. In the past, fishery management measures, such as landing limits, size limits, and species landing restrictions were largely enforced by the relatively easy and inexpensive method of dockside enforcement. Enforcing depth-based closed areas represents a more costly and difficult challenge, because effective enforcement requires frequent patrolling of the shoreward and seaward boundaries of the conservation areas. The single biggest factor that allows some operators to avoid compliance with closed area management measures, is that much of the fishing activity takes place out of view of anyone other than the vessel crew. Because VMS provides reliable and accurate information on the location of vessels and can be used to identify where fishing activity takes place with a reasonable degree of accuracy, VMS is a practical means of monitoring vessels activity in relation to area restrictions.

VMS will potentially show enforcement officers breaches of time/area restrictions. VMS can show officers those vessels that are following the rules as well those which are not. In doing so, it makes the activities of investigating officers much more cost effective because less time will be spent pursuing false trails and fishing operators who are following the rules.

Patrols by both sea and air will still be necessary for fully effective monitoring and management even with

an effective VMS program. A patrolling aircraft or vessel can spend considerable time and fuel investigating legitimate fishing vessels that will appear on their radar. Providing access to VMS data for patrol craft can minimize the effort spent confirming radar contacts of vessels fishing legitimately and thereby increase the efficiency of surveillance patrols. Further, identifying legitimate fishing vessels to patrol craft via VMS may help them choose particular contacts for more productive investigation when several contacts are made by radar.

In some cases, enforcement officers will have particular vessels or particular situations for which they may wish to conduct an at-sea or landing inspection without warning to the vessel operator. Without VMS, it is extremely difficult to determine where a vessel is located at-sea or where and at what time it might enter port. VMS provides a reliable means of achieving this with potential savings in time and other expense in moving officers and aircraft or patrol vessels to the correct location at the appropriate time.

Vessel position data and fishery declarations, which are otherwise not available from this sector of the groundfish fleet, would be used to identify vessels fishing in the closed areas and to target landing and at-sea inspections. Accurate and timely position data is necessary to allow enforcement resources to be used efficiently to maintain the integrity of RCAs. In addition, the deterrent effect of VMS will likely reduce the number of closed area violations.

One of the major benefits of VMS is its deterrent effect. If fishing vessel operators know that they are being monitored and that a credible enforcement action will result from illegal activity, then the likelihood of that illegal activity occurring is significantly diminished. In this context, VMS is a preventive measure rather than a cure. To be effective as a deterrent, the VMS program must maintain its credibility in the eyes of the vessel operators and its use must be kept at the forefront of their minds if the deterrent effect is to be maintained. The credibility of the system can only be maintained if all operational issues are followed up, particularly those that affect a vessel, such as failure of the vessel to report on schedule. The presence of the VMS equipment on the vessel will be a reminder to operators of its monitoring operation.

The open access fleet consists of many smaller vessels with many being under 40 feet in length (Table 3.3.3.4). Smaller vessels are generally not able to withstand rough seas as well as larger vessels. Because much of the open access groundfish fleet is comprised of small vessels, much of the effort is thought to occur in waters near the seaward boundary of the nontrawl RCAs. It is presumed that fishers with smaller vessels (<40 ft) fishing seaward of the RCAs are more likely to encroach on the seaward boundary of the RCAs, because of the desire to fish nearer to shore for safety and to reduce fuel consumption and general wear and tear on the vessel. Table 4.3.1.1 shows the proportion of open access vessels by target fishery that are less than 40 feet in length. From this table, it can be seen that a large portion of the vessels that participate in the directed fisheries and who have a greater than 5 percent dependency on groundfish are small vessels. Many of the nearshore vessels may fish exclusively in state waters.

Table 4.3.1.1. Percent of open access vessels less than 40 feet (ft) in length, November 2000 through October 2001.

More than 5% of annual revenue from groundfish	
Target species	Vessel less than 40 ft in length
Sablefish	72%
Nearshore Rockfish	91%
Shelf Rockfish	90%
Slope rockfish	82%
Less than 5% of annual revenue from groundfish	
Sablefish	32%
Nearshore Rockfish	78%
Shelf Rockfish	60%
Slope rockfish	51%
Halibut	65%
Shrimp/prawn	21%
Dungeness crab	56%
Salmon	72%
HMS	31%
CPS	29%
Source: EIS, for the Proposed Acceptable Biological Catch and Optimum Yield Specifications and Management 2005-2006	

Indirect impacts on enforcement from fishery management actions include change in the availability of information used for conducting further investigations or used with other sources of information to better understand compliance behavior.

VMS positions can be efficient in identifying possible illegal fishing activity and can provide a basis for further investigation by one or more of the traditional enforcement measures. VMS positions in themselves can also be used as the basis for an enforcement action. The positions may also be used to establish "probable cause" before pursuing some types of investigations, for example, in obtaining a search warrant. While not being evidence of sufficient significance by itself, VMS position data could provide sufficient evidence to lead an officer to believe that an illegal act had occurred that warrants further investigation.

Expansion of the VMS program clearly supports an enforcement mission and may also have indirect benefits to Homeland Security activities. Increased border security correlates directly with increased risk within our EEZ and along our coast line for illegal entry. In March 2002, the "Citizen Corps" initiative was announced, which includes the expansion of "Neighborhood Watch" to include the participation of ordinary citizens in detecting and preventing terrorism. Under "Coastal Watch", the Coast Guard requests fishers to report suspicious activities for investigation and intelligence purposes. Critical decisions on the deployment of enforcement assets could be based on VMS position reports. Satellite communication

could also update essential information during a law enforcement response. Investigative methodologies could be enhanced via surveillance data maintained within VMS, such as easily identifying potential witnesses to incidents, locating U.S. vessels in areas of suspicious activity for assistance and support and increased intelligence gathering capabilities. By expanding the number of U.S. fishing vessels operating with VMS, NOAA and fishers are expanding the capability to detect and prevent terrorism and other criminal activity in the EEZ. VMS also supports the Coast Guard's "Coastal Watch" initiative, which was developed in response to their homeland defense activities.

Comparison of the Alternatives

VMS would not replace or eliminate traditional enforcement measures such as aerial surveillance, boarding at-sea via patrol boats, landing inspections and documentary investigation. Traditional enforcement measures may need to be activated in response to information received via the VMS. Because the level of VMS coverage in the open access fleet varies between the alternatives, the degree to which a VMS program would aid enforcement in identifying vessels that are legally operating in the conservation areas from those that are fishing illegally or benefit enforcement in conducting further investigations would depend on the proportion of vessels required to carry and use VMS as well as the amount of time the vessels engage in fisheries in areas where the RCA restrictions or other area restrictions (such as OA incidental target fisheries or habitat protection area) apply.

Alternative 1 requires exempted trawl vessels to provide declaration reports prior to leaving port on a trip in which fishing occurs in an RCA. The greatest difficulty in maintaining the integrity of closed areas and the least efficient use of limited state and federal enforcement resources occurs under status quo, Alternative 1. Alternative 2 maintains the provisions of status quo, but adds the VMS and declaration reporting requirements for approximately 165 longline vessels (131 directed groundfish, 31 Pacific halibut, 1 California halibut, and 2 HMS vessels) using longline gear to take and retain, possess or land groundfish. Of the alternatives that require VMS, Alternative 2 requires the smallest proportion of the open access fleet (only vessels using longline gear) to have and use VMS. In recent years, the directed halibut fishery south of Point Chehalis has occurred in 3-6 one day 10 hour long openings per year. Given the duration of the directed halibut fishery, requiring the Pacific halibut vessels that retain groundfish to have VMS would provide minimal additional position data for enforcement purposes. Some fishers, those who do not otherwise fish in the groundfish fishery and land less than \$1,000 in incidentally caught groundfish caught during the primary halibut season, would likely choose to discard incidentally caught groundfish, rather than incur the cost of VMS and the burden of installation. Between 2000 and 2003, an annual average of only 2 HMS longline vessels landed incidental groundfish. HMS longline gear is currently not permitted in the EEZ off the West Coast; therefore, no additional HMS vessels over those affected by status quo would be included as a result of Alternative 2. Because the fishery occurs outside the RCA, HMS longline vessels would transit through the RCA and therefore pose a minimal risk to the integrity of the RCAs. Monitoring HMS longline vessels in relation to the RCA requirements is a lower priority to enforcement.

Alternative 3 includes the same vessels as Alternative 2, but adds the VMS and declaration reporting requirements for vessels using pot gear that take and retain, possess or land OA groundfish. Approximately 293 vessels, those identified under Alternative 2 plus approximately 128 vessels using pot gear (30 directed, 45 Dungeness crab, 8 prawn, 8 CA sheephead, and 37 CA halibut) would be included under Alternative 3. A small proportion of the Dungeness crab vessels, less than 10 percent (45 vessels per year), actually land the groundfish incidentally taken during the Dungeness crab season. The Dungeness crab fishery primarily occurs in depths between 5-100 fathoms of water. When the nontrawl RCAs extend from shore to 100 fm, as they are proposed for 2005 in the area North of 46°16' N. lat, the Oregon-Washington border, any groundfish retained by a pot vessel fishing for Dungeness crab would be required to have been caught the groundfish seaward of the 100 fm line. In addition, regulations prohibit vessels from fishing both shoreward and seaward of the RCA on the same trip. VMS could be used to determine if all fishing on a trip in which groundfish was retained occurred seaward of the RCA, or if fishing actually occurred within the RCA. Because few if any vessels target Dungeness crab offshore of 100 fm, the proposed action is expected to affect few if any Dungeness crab vessels that only fish in

waters off the state of Washington. For the coast south of the Oregon-Washington border, the proposed open access nontrawl RCA areas are defined by a shoreward fm curve that is seaward of areas where Dungeness crab fishing occurs. VMS would aid enforcement in maintaining the integrity of the shoreward boundary.

The California nearshore fisheries includes vessels that use traps or pot gear to harvest species managed under the groundfish plan as well as non-groundfish such as California Sheephead and Scorpionfish. Of the 37 vessels per year that landed sheephead, all 37 vessels retained open access groundfish. Because the nearshore fishery primarily occurs in state waters, it is likely that many of the vessel that only fish in state waters and would not be subject to the VMS requirements proposed under Alternatives 3-7; therefore, no VMS position data would be available to enforcement from these vessels. The open access nontrawl RCA between 40°10 and 34°27 N. lat. has a seaward boundary of 150 fm year round and a shoreward boundary of 20 fm during the summer (May-August) and 30 fm for the remainder of the year. Similarly, the proposed open access nontrawl RCA south of 34°27 N. lat. has a seaward boundary of 150 fm year round and a shoreward boundary of 60 fm throughout the year. When the shoreward boundary is deeper than 20 fm, it is likely that some vessels will enter the EEZ to fish and be required to carry VMS for the remainder of the year. During the period when the fishery is constrained to 20 fm, there may be a greater incentive for some fishers to harvest nearshore species in deeper water. VMS would be an effective deterrent to illegal fishing in the RCA's. Traditional enforcement measures will likely continue to be the dominant enforcement tool used for monitoring the integrity of the RCA's shoreward line, particularly north of 34°27 N. lat. In the area south of 34°27 N. lat, there may be more incentive for vessels to fish in the EEZ because the shoreward boundary of the RCA extends further into the EEZ.

Alternative 4 includes the same vessels as Alternative 3, but adds the VMS and declaration reporting requirement for approximately 334 vessels, those identified under Alternatives 2 and 4 plus 18 ridgeback prawn, 6 sea cucumber and 17 California halibut vessels using exempted trawl gear (excludes pink shrimp vessels). During the period when the fishery south of 40°10 N. lat. is constrained to 75 fm there may be a greater incentive for some fishers to harvest in deeper water. Having VMS would be expected to be an effective deterrent and aid enforcement in maintaining the integrity of the shoreward line of the RCAs.

Alternative 5A includes the same vessels as Alternative 4, but adds the VMS and declaration reporting requirements for approximately 1,189 vessels, those identified under Alternatives 2,3,and 4 plus 738 directed groundfish, 105 California halibut, and 12 HMS vessels using line gear to take and retain, possess or land groundfish(excludes salmon troll vessels). During the period when the fishery is constrained to 20 fm there may be a greater incentive for some fishers to harvest in deeper water. VMS would be an effective deterrent to illegal fishing in the RCAs. As stated above, traditional enforcement measures will likely continue to be the dominant enforcement tool used for monitoring the integrity of the RCAs shoreward line, particularly north of 34°27 N. lat. In the area south of 34°27 N. lat, there may be more incentive for vessels to fish in the EEZ because the shoreward boundary of the RCA extends further into the EEZ.

The inclusion of line vessels more than triples the number of vessels that would be required to have and use VMS. Though this is a large increase in vessels, the system developed for limited entry vessels already has the capacity to process these position data. Including most vessels in the VMS program could be expected to result in time savings for officers in the field and allow them time to conduct more focused investigations than would otherwise possible. Alternative 5B, includes 1,307 vessels, which is slightly more vessels than 5A because 177 salmon troll vessels are added under this alternative, though 14 HMS and 45 Dungeness crab vessels would not be included.

In general, VMS is an efficient enforcement tool for monitoring if a fishing trip occurred entirely inside or outside and RCA. Using VMS in this way would allow enforcement to determine which cumulative trip limits applied to a particular vessel. However, for salmon troll vessels north of 40°10 N. lat., there has been an allowance to retain yellowtail rockfish only on a trip that occurred both inside and outside and

RCA. VMS would be most suited for monitoring cumulative trip limits of groundfish species other than yellowtail rockfish taken and retained by salmon troll vessels north of 40°10 N. lat.

Alternative 6, which applies to any vessel engaged in commercial fishing to which a RCA restriction applies, includes the largest number of open access vessels, 1,396 vessels. Therefore, Alternative 6 would provide the largest amount of data for enforcement purposes. Alternative 6B, affects approximately 43 fewer vessels annually than does Alternative 6A, 1,353 vessels. Alternative 7, is essentially the same as Alternative 6A, 1,374 vessels, because it applies to the same vessels except that vessels less than 12 feet in length would be excluded. Most if not all of the 22 vessels that are under 12 feet in length are unlikely to fish in Federal waters and would therefore not trigger the VMS requirement.

In summary, the availability of information needed by enforcement to efficiently maintain the integrity of conservation areas would be greatest under Alternatives 6A and 7, and would provide the most amount of information on fishing locations for the greatest number participants, followed by 6B and then 5B. Alternatives 5B-7 will allow enforcement resources to be used efficiently to maintain the integrity of RCAs and may also be available to support salmon fishery area management measures. Under Alternatives 2-7 data position data may also be available to support enforcement actions for time area management of various state fisheries.

SOCIO-ECONOMIC ENVIRONMENT - COMPARISON OF THE ALTERNATIVES	
FISHERY MANAGEMENT	Changes to how the fisheries are managed as a result of the collection of VMS position data
Alternative 1 Status quo	<p><u>Direct impact</u> The use of area management regulations may need to be simplified, or buffers around closed areas added so the integrity of closed areas can be maintained. The use of management regulations that limit the duration or number of trips are less likely to be considered without adequate monitoring mechanisms.</p> <p><u>Indirect impact</u> Little position and effort data available from OA fisheries. Without adequate position and effort data, the use of observer and survey data for refining OA fishery total catch estimates for inseason management is very limited. Non-groundfish fisheries continue to occur in RCA, but incidental groundfish landings other than yellowtail rockfish north of 40°10' N. lat. cannot be retained or landed. Similarly, If a vessel fishes in the RCA on a trip, groundfish cannot be retained from areas outside the RCAs on the same trip. Some vessels: may misreport catch for areas other than where it was caught.</p>
Alternative 2 Vessels using longline gear	<p><u>Direct impact</u> VMS would allow for greater flexibility in the use of management rules with geographical areas restrictions including: seasonal access, closed areas, depth restrictions, limited by duration, or number of trips for approximately 165 vessels (131 directed groundfish, 31 Pacific halibut, 1 CA halibut, and 2 HMS OA vessels) using longline gear to take and retain, possess or land OA groundfish. VMS is likely to deter the misreporting of catch taken with longline gear for areas other than where fish were caught and thereby helping to maintain the integrity of data used for groundfish management decisions and possibly Pacific halibut management.</p> <p><u>Indirect impact</u> Increased OA longline position and effort data could be used along with declaration reports, observer data, survey information, and fish ticket data to better refine estimates of total fishing mortality and improve the ability to manage the fishery inseason to stay within the harvest guidelines and OYs. VMS may result in increased bycatch and lost landings data if incidental groundfish catch by Pacific halibut vessels is not retained. The added cost of VMS may result in Pacific halibut vessels choosing to not retain groundfish to avoid VMS requirements, particular 31 vessels with less than \$1,000 of annual revenue from groundfish. HMS longline gear is currently prohibited in EEZ.</p>
Alternative 3 Vessels using longline or pot gear	<p>In addition to impacts identified under Alt. 2:</p> <p><u>Direct impact</u> VMS would allow for greater flexibility in the use of management rules for approximately 128 vessels (30 directed, 45 Dungeness crab, 8 prawn, 8 CA sheephead, and 37 CA halibut vessels) using pot gear that take and retain, possess or land OA groundfish. Likely to deter misreporting of catch taken with pot and longline gear for areas other than where fish were caught and thereby help to maintain the integrity of data used for groundfish management decisions and possibly Dungeness crab, prawn, and CA nearshore species management.</p> <p><u>Indirect impact</u> Increased longline and pot position and effort data could be used along with declaration reports, observer data, survey information, and fish ticket data to better refine estimates of total fishing mortality and improve the ability to manage the fishery inseason to stay within the harvest guidelines and OYs. The added cost of VMS may result in vessels choosing to not retain groundfish to avoid VMS requirements, particular those vessels in incidental fisheries that are averaging less than \$1,000 of annual revenue from groundfish.</p>

<p>Alternative 4 Vessels using longline, pot or trawl gear, except pink shrimp trawl</p>	<p>In addition to impacts identified under Alt. 2 and 3:</p> <p><u>Direct impact</u> VMS would allow for greater flexibility in the use of management rules for approximately 18 ridgeback prawn, 6 sea cucumber and 17 CA halibut OA vessels using exempted trawl gear take and retain, possess or land OA groundfish. Likely to deter misreporting of catch taken with pot and longline gear for areas other than where fish were caught and thereby help to maintain the integrity of data used for groundfish management decisions and possibly prawn, sea cucumber, and CA halibut management.</p> <p><u>Indirect impact</u> Increased longline, pot and exempted trawl position and effort data could be used along with declaration reports, observer data, survey information, and fish ticket data to better refine estimates of total fishing mortality and improve the ability to manage the fishery inseason to stay within the harvest guidelines and OYs. The added cost of VMS may result in trawl vessels choosing to not retain groundfish to avoid VMS requirements, particular those vessels in incidental fisheries that are averaging less than \$1,000 of annual revenue from groundfish.</p>
<p>Alternative 5A Vessels using longline, pot, trawl or line gear, except: pink shrimp trawl and salmon troll.</p>	<p>In addition to impacts identified under Alt. 2, 3, and 4:</p> <p><u>Direct impact</u> VMS would allow for greater flexibility in the use of management rules for approximately 855 vessels (738 groundfish, 105 CA halibut, and 12 HMS vessels) using line gear to take and retain, possess or land OA groundfish. Likely to deter misreporting of catch taken with pot and longline gear for areas other than where fish were caught and thereby helping to maintain the integrity of data used for groundfish management decisions and possibly HMS and CA halibut management.</p> <p><u>Indirect impact</u> Increased longline, pot and exempted trawl position and effort data could be used along with declaration reports, observer data, survey information, and fish ticket data to better refine estimates of total fishing mortality and improve the ability to manage the fishery inseason to stay within the harvest guidelines and OYs. The added cost of VMS may result in line vessels choosing to not retain groundfish to avoid VMS requirements, particular those vessels in incidental fisheries that are averaging less than \$1,000 of annual revenue from groundfish.</p>
<p>Alternative 5B Vessels using longline, pot, trawl or line gear, except: pink shrimp trawl, HMS longline & line, and Dungeness crab pot gear.</p>	<p><u>Direct impact</u> VMS would allow for greater flexibility in the use of management rules as identified under Alt. 2, 3 and 4, except Dungeness crab and HMS vessels would not be included, but approximately 177 salmon troll vessels that take and retain, possess or land OA groundfish would be included. VMS is likely to deter misreporting of groundfish catch for areas other than where fish were caught by vessels identified under Alt. 2, 3, 4, and 5A (excluding Dungeness crab pot gear, HMS line gear, HMS longline gear) plus salmon troll vessels, and thereby will help to maintain the integrity of data used for groundfish management and possibly salmon management.</p> <p><u>Indirect impact</u> VMS data from vessels identified under Alt. 2, 3, 4, and 5A (excluding Dungeness crab and HMS vessels) plus approximately 241 salmon troll vessels could be used along with declaration reports, observer data, survey information, and fish ticket data to better refine estimates of total fishing mortality and improve the ability to manage the fishery inseason to stay within the harvest guidelines and OYs. The added cost of VMS may result in vessels choosing to not retain groundfish to avoid VMS requirements, particular vessels in incidental fisheries that are averaging less than \$1,000 of annual revenue from groundfish.</p>

<p>Alternative 6A Vessels with RCA restrictions</p>	<p><u>Direct impact</u> VMS would allow for greater flexibility in the use of management rules for: 214 vessels using longline gear as identified under Alt. 2 except that all 49 Pacific halibut vessels are included; 128 vessels using pot gear identified under Alt. 3; all vessels using trawl gear (approximately 32 ridgeback prawn, 14 Sea cucumber, and 34 California halibut vessels); 1,032 vessels using line gear as identified under Alt. 5B (includes salmon troll coastwide) to take and retain, possess or land OA groundfish; 3 vessels using net gear (approximately 3 CPS vessels); and 4 vessels using other OA gears. Likely to deter misreporting of groundfish catch for areas other than where fish were caught and thereby helping to maintain the integrity of data used for groundfish management and possibly salmon management.</p> <p><u>Indirect impact</u> Increased position and effort data from: vessels using longline gear as identified under Alt. 2 except that all 49 Pacific halibut vessels are included; 128 vessels using pot gear identified under Alt. 3; all vessels using trawl gear (approximately 32 ridgeback prawn, 14 Sea cucumber, and 34 California halibut vessels); 1,032 vessels using line gear as identified under Alt. 5B (includes salmon troll coastwide) to take and retain, possess or land OA groundfish; vessels using net gear (approximately 3 CPS vessels); and 4 vessels using other OA gears. Data could be used along with declaration reports, observer data, survey information, and fish ticket data to better refine estimates of total fishing mortality and improve the ability to manage the fishery inseason to stay within the harvest guidelines and OYs. The added cost of VMS may result in vessels choosing to not retain groundfish to avoid VMS requirements, particular vessels in incidental fisheries that are averaging less than \$1,000 of annual revenue from groundfish.</p>
<p>Alternative 6B Vessels with RCA restrictions except salmon troll north that retain only yellowtail rockfish</p>	<p><u>Direct impact</u> VMS would allow for greater flexibility in the use of management rules for slightly fewer vessels than those identified under Alt. 6A, because salmon troll vessels fishing north of 40°10' N. lat. that only land yellowtail rockfish would be excluded. Deterrent effect for misreporting of catch for areas other than where fish were caught is slightly less than Alt.6A.</p> <p><u>Indirect impact</u> VMS would decrease position and effort data for slightly fewer vessels than those identified under Alt. 6A, because salmon troll vessels fishing north of 40°10' N. lat. that only land yellowtail rockfish would be excluded. Fewer salmon vessels would be expected to discard groundfish to avoid VMS requirements.</p>
<p>Alternative 7 Vessel >12 ft with RCA restrictions</p>	<p><u>Direct impact</u> VMS would allow for greater flexibility in the use of management rules for slightly less vessels than those identified under Alt. 6A. Approximately 22 vessels under 12 ft in length would be excluded. Deterrent effect for misreporting of catch for areas other than where fish were caught is slightly less than Alt. 6A. However, few if any of these vessels are expected to fish in Federal waters.</p> <p><u>Indirect impact</u> Similar to those impacts identified under Alt.6A. because 22 vessels under 12 ft in length would be excluded. Few if any of these vessels are expected to fish in Federal waters.</p>

4.3.2 Fishery Management

Direct impacts on fishery management actions includes changes in the availability of information that directly aids fishery managers in administering time/areas restrictions. These restrictions typically include: seasonal access restrictions to a resources, closed area management, depth restrictions, trip duration restrictions, or limits on the number trips. Deterring misreporting of catch for areas other than where fish were caught is also a direct effect on management because accurate information is needed to maintain the integrity of data used for management decisions made during the fishing season.

When there is a high degree of error or potential non-compliance associated with time/area restrictions, meeting management objectives is more difficult. Therefore, managers must be more conservative in order to meet harvest objectives. Having greater flexibility in the use of management rules with time/areas restrictions is advantageous because it allows managers to deal with harvest issues on a refined level, rather than having to be more conservative to buffer for greater error or potential non-compliance. If problems can be identified early, prompt action can be taken to minimize the impacts on the groundfish fleet or the stock. For example, if fishing effort by some or all sectors of the fishery shifts to areas where data indicates that higher bycatch are likely, preseason projections may be inaccurate. If managers can identify such shifts, they may be able to restrict access to areas of high bycatch to keep overall catch within the harvest specifications.

Some mis-reporting and transcription errors can be addressed using VMS. Misreporting of catch directly undermines efforts to manage fisheries properly and impedes progress toward the goal of sustainable fisheries. Deterring the misreporting of catch taken in areas other than where fish were caught helps to maintain the integrity of data used for management decisions.

When linked with a personal computer, lap top or data terminal, VMS systems with 2-way communications (currently 2-way systems are not required in the groundfish fishery) can provide commercial fishers with the opportunity to report catch information electronically to home offices and fisheries managers. Under VMS, detailed commercial catch data and details of specific areas fished (provided by GPS) could be recorded using on-board computers or a mobile terminal and transmitted directly to a central database. The central database could be programmed to analyze the aggregate data from all vessels as it is received, thereby enabling the performance of the fishery to be monitored in 'real time', allowing more effective and timely fisheries management strategies to be developed. Satellite technology has the potential to quickly transform fisheries management from being reactive, based on limited historical data, to a pro-active process involving decisions based on analysis of real time data about the fishery. Fisheries management strategies are underpinned by catch data supplied by fishers and processors. There is usually a substantial delay before fish tickets, the primary information source to assess fishing activities, is received, analyzed and available in a format suitable for use by fisheries managers.

Indirect impacts on fishery management include change is the availability of information used as a basis for making management recommendations and decision that are more distant in time. VMS position data along with data from other sources may be combined and analyzed to better understand the effectiveness of management actions at achieving the intended results and to make recommend for future measures.

Typically, fisheries management rules are designed to achieve sustainable and profitable fishing through a variety of methods. This usually includes some form of licensed vessel access to particular areas, restrictions on gear types, restrictions on fishing time, quotas on the amounts of particular species which may be caught, etc. Fishery management is most effective when catch in the fishery can be quantified and measured. This means measuring the quantity of fish being caught and identifying the place where the fish are caught. VMS does not provide information on the quantity of fish being caught nor does the system being proposed for the open access groundfish fishery require that the VMS system be used as a means of communicating catch information, though some VMS transceivers can be used as a communication tool. VMS does, however, clearly make it possible to improve the availability of data in relation to the location of fish catch.

Data gathered from commercial fisheries are needed to assess the effectiveness of management regulations. Logbooks, landing surveys, VMS, and observers are different fishery dependent methods used to collect data on harvest location. Interception at sea by an independent vessel can also be used to

obtain harvest location data. The cost of collecting data directly from fishery participants tends to be lower than collecting the data from an independent source. This is because it is a byproduct of the fishing activity. Some forms of fishery dependent data, particularly unverified logbooks and landing surveys, are more subject to bias than other methods and their collection and use in measuring the effectiveness of management measures requires added care such as verification procedures. Alternatives 2 -7 provide for expanded VMS coverage that has the potential of producing reliable and useful position data for assessing the effectiveness of open access fishery management measures relating to time and area management. At a minimum, the data can be used to efficiently monitor fishing location and to verify times and dates for the open access fleet where logbook data is generally not available. It can also be used to provide information on days at sea and effort by area. When combined with observer data, broader interpretations of position data may be possible.

Understanding where fishing effort is occurring in real time may provide insight into understanding information reported on fish tickets and be useful in understanding how management measures affect fishing behavior. Knowing where a vessel is fishing as compared to where the catch is being landed, may be valuable in assessing the effectiveness of trip limit management lines and differential trip limits. The data provided by VMS are cost effective and accurate over large geographical areas. Accurate and timely data on fishing locations are necessary to assess effectiveness of closed areas and the overall results of the management scheme.

VMS data can be combined with observer data to assess the effectiveness of management measures. However, the value in combining observer data with VMS data for non-enforcement purposes depends on the amount of observer data on catch and discards that is available from the different gears and fishing strategies. At this time, there is little data on the open access fisheries. In the long term, when observer data becomes available, VMS may provide information that results in a better understanding of fishery location and a spacial understanding of fish stocks.

As noted above, electronic logbooks have been developed that can be integrated with VMS transceivers with two-way communications. If electronic logbooks could be combined with a VMS system for all or a portion of the open access fisheries, there would be several indirect benefits to management and to the quality and availability of information on which management decisions are based. First, there is only a single data entry function and this can be performed very soon after each fishing operation is completed (at-sea or shoreside depending on the individual fishery). Paper logbooks must first be filled out by the fisher and then submitted to a government agency for data entry before logbook data can be used. In performing the data entry function, the fisher will interact directly with the editing checks for the data and a more complete and accurate data record can be required before the data record is accepted by the computer system. Having electronically recorded the data, the operator may produce a hard copy and also transmit the data to the fisheries agency or other recipients such as the fishing company, allowing that data to be easily incorporated into appropriate databases. As a result, improvements in timeliness, accuracy and reduced costs are possible. When the data is in the database and available to be analyzed, it can be used to improve the ability of managers to measure the effectiveness and economic impacts of management measures.

Comparison of the Alternatives

Alternative 1 requires exempted trawl vessels to provide declaration reports prior to leaving port on a trip in which fishing occurs in an RCA. Under Alternative 1, the least amount of data would be available to support a flexible management regime or to deter misreporting of catch. However, this is the alternative that is most likely to result in incidentally caught groundfish being retained because the added cost for retaining incidentally caught groundfish is minimal and may be used to offset the cost of the fishing trip for the target species. Alternative 2 maintains the provisions of status quo, but adds the VMS and declaration reporting requirements for approximately 131 directed groundfish, 31 Pacific halibut, 1 California halibut, and 2 HMS vessels using longline gear to take and retain, possess or land OA groundfish. Of the alternatives that require VMS, Alternative 2 requires the smallest proportion of the open access fleet (only 165 vessels using longline gear) to have and use VMS. On average between 2000 and 2003, the longline gears landed the greatest amount of groundfish by weight of any of the OA sectors.

Alternative 3, includes the same vessels as Alternative 2, but adds the VMS and declaration reporting requirements for approximately 128 vessels (30 directed, 45 Dungeness crab, 8 prawn, 8 CA sheephead,

and 37 CA halibut vessels) using pot gear to take and retain, possess or land OA groundfish. Therefore, Alternative 3 would provide more data than Alternative 2; however, it would provide less data than Alternative 4. Alternative 4 includes the same vessels as Alternative 3, but adds the VMS and declaration reporting requirement for approximately 18 ridgeback prawn, 6 sea cucumber and 17 California halibut vessels using exempted trawl gear (excludes pink shrimp vessels) to take and retain, possess or land OA groundfish. Alternative 5A includes the same vessels as Alternative 4, but adds the VMS and declaration reporting requirements for approximately 738 vessels groundfish, 105 California halibut, and 12 HMS vessels using line gear to take and retain, possess or land groundfish(excludes salmon troll vessels). Alternative 5B, includes slightly more vessels than 5A because the number of salmon troll vessels that would be added under this alternative is greater than the number of HMS and Dungeness crab vessels that would not be included. Though Alternative 5B does not include vessels in fisheries that are projected to have minimal impacts on overfished species (12 HMS line and 2 longline, 45 Dungeness crab pot), it includes approximately 177 salmon troll vessels.

Alternative 6A, which applies to any vessel engaged in commercial fishing to which a RCA restriction applies, includes the largest number of open access vessels. Therefore Alternative 6 would provide the most VMS data and would support the most flexible management regime and would likely deter misreporting of catch location. The added cost of VMS is likely to result in most fishers not retaining groundfish so as to avoid the VMS requirements. Table 4.3.2.1 shows the proportion of vessels by gear group that averaged less than \$1,000 in annual exvessel revenue from groundfish. These are fishers that could be expected to avoid the VMS requirement. However, it must be noted that these values are based on averages. For any given vessel, the catch may be higher or lower than the average. Annual exvessel revenue for all species revenue for many of the incidental fisheries was substantially higher for most fisheries (Table 4.3.3.5). Some fishers making less than \$1,000 may speculate that others will leave the fishery and trip limits will increase, so they will pay for VMS and continue to retain groundfish. It must be noted that some unknown number of fishers with annual exvessel revenue of groundfish that is greater than \$1,000 will also likely drop out of the fishery, much of the decision will be based on their expected catch of groundfish and the added cost of catching that groundfish. Alternative 6B, affects approximately <134 vessels annually than does Alternative 6A, all of whom use salmon troll gear north of 40°10' N. lat. and retain only yelloweye rockfish. Alternative 7, is almost the same as Alternative 6A because it applies to the same vessels except that vessels less than 12 feet in length would be excluded. Most if not all vessels under 12 feet in length are not expected to fish in Federal waters and would therefore not trigger the VMS requirement.

Table 4.3.2.1 Open Access incidental fisheries, proportion of vessels by gear with average annual exvessel values of catch less than \$1,000, 2000-2003

Gear	Proportion of vessels with less than \$1,000 annual exvessel revenue from groundfish
Longline	
Pacific Halibut	68%
California Halibut	100%
Pot	
Dungeness crab	62%
Prawn	75%
California Sheephead	88%
Trawl	
Ridgeback prawn	72%
Sea cucumber	100%
California halibut	76%
Line	
HMS	83%
Salmon troll (coastwide)	99%
California halibut	99%
Net	
CPS	100%
Other gears	
Mixed	100%

SOCIO-ECONOMIC ENVIRONMENT - COMPARISON OF THE ALTERNATIVES	
HARVESTERS & PROCESSORS	Changes in fishery participation costs and groundfish revenue as a result of the requirement to carry and use VMS.
Alternative 1 Status quo	<p><u>Direct impacts</u> No change in fishery participation costs for harvesters.</p> <p>If the use of area management regulations is simplified, or buffers around closed areas added; so the integrity of closed areas can be maintained, fishers will likely encounter increased costs from fishing in areas where catch rates are lower.</p> <p>Because enforcement has less ability to target enforcement activities, vessels without VMS or declaration reports may be the subject of more investigations and boardings than vessels with VMS or those providing declaration reports.</p> <p><u>Indirect impacts</u> Potential future groundfish catch levels may be reduced and stability in the fishery may be decreased if non-compliance with depth-based management measures results in higher than projected of overfished species catch.</p>
Alternative 2 Vessels using longline gear	<p><u>Direct impacts:</u> Per vessel costs for a transceiver unit with installation are \$1,200-\$2,700 in Year 1, and \$250-\$625 in subsequent years. Annual operating cost to harvesters include: maintenance \$60-\$160 and transmission fees \$192-\$730. Fishers who land groundfish taken incidentally in non-groundfish fisheries and fishers who are less dependent on groundfish may choose to exit the fishery by not retaining groundfish or by not targeting groundfish. Approximately 131 directed groundfish, 31 Pacific halibut, 1 CA halibut, and 2 HMS vessels using open access longline gear that make less than \$1,000 in annual revenue from groundfish would likely leave the open access groundfish fishery. An unknown portion of directed groundfish vessels using longline gear to take and retain, possess or land groundfish may choose to change gears to pot or line gear avoid VMS requirements. Estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is \$249,150-\$756,690 year 1, \$51,150 - \$129,690 in subsequent years.</p> <p>Greater flexibility in the use of management rules with geographical areas restrictions allows greater access to healthy stocks than would otherwise be allowed.</p> <p><u>Indirect impacts:</u> Potential for future increases in groundfish catch levels could offset short-term economic loss associated with VMS if increased stability in the fishery results because the integrity of RCAs is maintained. Benefits of fishery stability would likely be greatest for fishers with high degrees of dependency on groundfish. If less dependent vessels leave the fishery groundfish, landings limits for healthy stocks could potentially increase for fishers remaining in the fishery.</p> <p>Vessels that purchase VMS units with 2-way communications could choose to use email communications to market catch that would otherwise be discarded at sea. If this were to occur, it could lead to greater efficiencies in seafood marketing and reduced discards for approximately 131 directed groundfish, 31 Pacific halibut, 1 CA halibut, and 2 HMS vessels using open access longline gear. If a large portion of the fishery chose to use 2-way communications to contact a broader range of buyers and coordinate deliveries or to negotiate purchase prices, it could result in shift in the processing sector.</p> <p>Processors buying low volumes of groundfish from a large number of fishers who each land small amounts, such as occurs in the live-fish fisheries, may have difficulty obtaining groundfish if the number of fishers who choose to exit the fishery is substantial in a given port.</p>

<p>Alternative 3 Vessels using longline or pot gear</p>	<p><u>Direct impact:</u> Per vessel costs are the same as Alt. 2. In addition to Alt. 2, approximately 128 vessels (30 directed, 45 Dungeness crab, 8 prawn, 8 CA sheephead, and 37 CA halibut vessels) using pot gear that make less than \$1,000 in annual revenue from groundfish would likely leave the open access groundfish fishery. An unknown portion of directed groundfish vessels using pot gear may choose to change to line gear to avoid VMS requirements. Estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is \$442,430 - 1,343,699 in year 1, and \$90,830-\$230,298 in subsequent years.</p> <p>Greater flexibility in the use of management rules with geographical areas - slightly greater benefit than Alt. 2 because both longline and pot vessels that take and retain, possess or land groundfish are included.</p> <p><u>Indirect impact:</u> Potential for future increases in groundfish catch levels slightly increased over Alt. 2., because likelihood of RCA integrity being maintained is increased when both longline and pot vessels that take and retain, possess or land groundfish are included. Benefits of fishery stability would be greatest for fishers with high degree of dependency on groundfish.</p> <p>Potential benefits of marketing efficiencies and potential shift in processing sector is as identified under Alt. 2 plus approximately 128 vessels using pot gear could choose to use VMS communications as marketing tool. Risk to low volume processors, slightly greater than Alt. 2</p>
<p>Alternative 4 Vessels using longline, pot or trawl gear (except pink shrimp)</p>	<p><u>Direct impact:</u> Per vessel costs are the same as Alt.2. In addition to Alt. 2 and 3, approximately 18 ridgeback prawn, 6 sea cucumber and 17 CA halibut vessels using exempted trawl gear that make less than \$1,000 in annual revenue from groundfish would likely leave the open access groundfish fishery. Estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is \$504,340 -\$1,531,724 in year 1, and \$103,540 -\$262,524 in subsequent years.</p> <p>Greater flexibility in the use of management rules with geographical areas - slightly greater benefit than Alt. 3 because longline, pot, and exempted trawl (excluding pink shrimp) vessels that take and retain, possess or land groundfish are included.</p> <p><u>Indirect impact:</u> Potential for future increases in groundfish catch levels slightly increased over Alt. 3., because likelihood of RCA integrity being maintained is increased when longline, pot, and exempted trawl (excluding pink shrimp) vessels are included. Benefits of fishery stability would be greatest for fishers with high degree of dependency on groundfish.</p> <p>Potential benefits of marketing efficiencies and potential shift in processing sector is as identified under Alt. 2 and 3 plus approximately 41 vessels using exempted trawl gear could choose to use VMS communications as marketing tool. Risk to low volume processors, slightly greater than Alt. 3</p>

<p>Alternative 5A Vessels using longline, pot, trawl or line gear, except: pink shrimp trawl and salmon troll.</p>	<p><u>Direct impact:</u> Per vessel costs are the same as Alt.2. In addition to Alt. 2, 3, and 4, approximately 855 vessels (738 groundfish, 105 CA halibut, and 12 HMS vessels) using line gear to take and retain, possess or land groundfish that make less than \$1,000 in annual revenue from groundfish would likely leave the fishery. Estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is \$1,795,390 - 5,452,754 in year 1, and \$368,590 - \$934,554 in subsequent years.</p> <p>Greater flexibility in the use of management rules with geographical areas - slight greater benefit than Alt. 4 because longline, pot, exempted trawl (excluding pink shrimp), and line vessel (excluding salmon troll) that take and retain, possess or land groundfish are included.</p> <p><u>Indirect impact:</u> Potential for future increases in groundfish catch levels slightly increased over Alt. 4., because likelihood of RCA integrity being maintained is increased when longline, pot, exempted trawl (excluding pink shrimp), and line vessel (excluding salmon troll) that take and retain, possess or land groundfish are included. Benefits of fishery stability would be greatest for fishers with high degree of dependency on groundfish.</p> <p>Potential benefits of marketing efficiencies and potential shift in processing sector as identified under Alt. 2, 3 and 4 except that approximately 738 groundfish, 105 California halibut, and 12 HMS vessels using line gear to take and retain, possess or land groundfish could also receive potential benefits of marketing efficiencies and stability in the groundfish fishery. Risk to low volume processors, slightly greater than Alt. 4</p>
<p>Alternative 5B Vessels using longline, pot, trawl or line gear, except: pink shrimp trawl, HMS longline & line, and Dungeness crab pot gear.</p>	<p><u>Direct impact:</u> Per vessel costs are the same as Alt.2. Vessels that make less than \$1,000 in annual revenue from groundfish would likely leave the fishery. Estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is \$1,973,570 - \$5,993,902 in year 1, and \$405,170 - \$1,027,302 in subsequent years.</p> <p>Greater flexibility in the use of management rules with geographical areas - slight greater than Alt. 5A because longline, pot, exempted trawl (excluding pink shrimp), and line vessels that take and retain, possess or land groundfish are included. HMS and Dungeness crab vessels are not projected to have overfished species catch in 2005; therefore excluding them would likely result in minimal if any changes to overfished species management flexibility.</p> <p><u>Indirect impact:</u> Potential for future increases in groundfish catch levels slightly increased over Alt. 5A., because likelihood of RCA integrity being maintained is increased when longline, pot, exempted trawl (excluding pink shrimp), and line vessels that take and retain, possess or land groundfish are included. Salmon troll vessels have a greater potential of taking constraining overfished species than do the Dungeness crab and HMS vessels that would be excluded under this alternative. Benefits of fishery stability would be greatest for fishers with high degree of dependency on groundfish.</p> <p>Potential benefits from marketing efficiencies and stability in the groundfish fishery as identified Alt. 2, 3, 4 and 5A, except Dungeness crab and HMS vessels, but for an additional 241 salmon troll vessels. Risk to low volume processors, slightly greater than Alt. 5A because salmon troll vessels are included</p>

<p>Alternative 6A Vessels with RCA restrictions</p>	<p><u>Direct impact:</u> Per vessel costs are the same as Alt.2. Vessels making less than \$1,000 in annual revenue from groundfish would likely leave the fishery. Estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is \$2,148,730-\$6,525,878 in years 1 \$441,130 - \$1,118,478 in subsequent years.</p> <p>Greatest flexibility in the use of management rules with geographical areas because all longline, pot, exempted trawl (excluding pink shrimp), and line vessel that have RCA restrictions would be included. Unlike 5B, all exempted trawl vessels would be included rather than only those that take and retain, possess or land groundfish.</p> <p><u>Indirect impact:</u> Potential for future increases in groundfish catch levels is greatest under this alternative, because likelihood of RCA integrity being maintained is increased when all vessels that have RCA restrictions are included. Benefits of fishery stability would be greatest for fishers with high degree of dependency on groundfish.</p> <p>Potential benefits from marketing efficiencies and stability in the groundfish fishery as identified under Alt. 2, 3, 4, & 5A and all Pacific halibut directed fishery vessels, vessels using salmon troll gear to take and retain, possess or land groundfish, and all vessels using exempted trawl gear. Risk to low volume processors similar to 5B</p>
<p>Alternative 6B Vessels with RCA restrictions except salmon troll north that retain only yellowtail rockfish</p>	<p><u>Direct impact:</u> Per vessel costs are the same as Alt.2. Vessels that are likely to leave the fishery is the same as Alt. 6A except that the number of salmon trollers that are likely to leave the fishery is slightly less than under Alt. 6A because vessels fishing north of 40°10' N. lat. that only land yellowtail rockfish would not be required to have VMS. The estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is \$399,590-\$1,013,154 in years 1, and \$1,946,390 -\$5,911,354 in subsequent years.</p> <p>Greater flexibility in the use of management rules with geographical areas (slightly less than 6A) because all longline, pot, exempted trawl (excluding pink shrimp), and line vessels (excluding salmon troll north of 40°10' N. lat. that only land yellowtail rockfish) that have RCA restrictions would be included. Unlike Alt.5B, all exempted trawl vessels would be included rather than only those that take and retain, possess or land groundfish.</p> <p><u>Indirect impact:</u> Potential for future increases in groundfish catch levels is slightly less than to those identified under Alt. 6A; salmon troll vessels fishing north of 40°10' N. lat. that only land yellowtail rockfish would be excluded.</p> <p>Potential benefits from marketing efficiencies as identified under Alt. 6A, because salmon troll vessels fishing north of 40°10' N. lat. that only land yellowtail rockfish would be excluded. Risk to low volume processors greatest, but similar to 5B</p>

<p><u>Alternative 7</u> Vessel >12 ft with RCA restrictions</p>	<p><u>Direct impact:</u> Per vessel costs are the same as Alt. 2. Vessels that are likely to leave the fishery is same as Alt. 6A plus than vessels less than 12 ft in length that make less than \$1,000 in annual revenue from groundfish would likely leave the fishery. Estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is \$2,115,510 - \$6,424,986 in year 1, and \$434,310 - \$1,101,186 in subsequent years.</p> <p>Greater flexibility in the use of management rules with geographical areas because all longline, pot, exempted trawl (excluding pink shrimp), and line vessels >12 ft in length that have RCA restrictions would be included. Unlike Alt.5B, all exempted trawl vessels would be included rather than only those that take and retain, possess or land groundfish. Basically, same as 6A because it is unlikely that many, if any, of the 22 vessels that are < 12 ft in length fish in Federal waters.</p> <p><u>Indirect impact:</u> Potential for future increases in groundfish catch levels is similar to those identified under Alt.6A because 22 vessels under 12 ft in length would be excluded. Few if any of these vessels are likely to fish in Federal waters.</p> <p>Potential benefits from marketing efficiencies similar to those identified under Alt.6A because 22 vessels under 12 ft in length would be excluded. Few if any of these vessels are expected to fish in Federal waters. Risk to low volume processors similar to 5B</p>
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4.3.3 Harvesters

Direct Impacts: While the primary focus of VMS, from a resource management perspective, is with the collection of position data to monitor compliance with depth-based area management, there are very clear benefits to industry from VMS. The most evident direct benefit to industry resulting from the availability of VMS information is the flexibility in fishery management, such as the use of depth-based management.

To allow for a more liberal depth-based management regime, as has been in place since 2003, it was necessary for the Council and NMFS to take action to establish a monitoring program to ensure the integrity of these large irregularly shaped depth-based conservation areas. With the 2003 Annual Specifications and Management Measures, the Council recommended along with depth-based management strategy, that NMFS include implementation of a VMS monitoring system to track movement of vessels through and within the RCAs. Without a depth-based management strategy, the fishery would be managed under more seriously constrained limits on healthy stocks that co-occur with overfished species. Geographically defined areas would likely revert to those that were in place before September 2002. These areas tended to be nearshore or defined by a simple latitude lines.

A more liberal depth-based management regime is only possible if the integrity of the depth-based conservation areas can be ensured. Maintaining the integrity of the conservation areas largely depends upon the ability to enforce such management measures. Without the ability to ensure the integrity of the conservation areas, it is most likely that the depth-based management strategy will be discontinued. If this were the case, the management structure for those fisheries without VMS could well revert back to more restrictive limits or no limits on healthy stocks in order to protect overfished species.

When linked with a personal computer, lap top or data terminal, VMS systems with 2-way communications (currently 2-way systems are not required in groundfish fishery). Two-way systems can provide commercial fishers with the opportunity obtain information from processors or home offices and to report catch information electronically to home offices and fisheries managers. Under VMS, detailed commercial catch data and details of specific areas fished (provided by GPS) could be recorded using on-board computers or mobile terminals and transmitted directly to a central database. The central database could be programmed to analyze the aggregate data from all vessels as it is received, thereby enabling the performance of the fishery to be monitored in 'real time', allowing more effective and timely fisheries management strategies to be developed. This provides potential cost savings for fishermen, particularly if fishery management transforms from being reactive to being a pro-active process involving decisions based on analysis of real time data about the fishery. Fisheries management strategies are underpinned by catch data supplied by commercial and recreational fishers. There is usually a substantial delay before this information is received, analyzed and available in a format suitable for use by fisheries managers and industry. Some mis-reporting and transcription errors can be addressed using VMS.

Cost burden: The cost burden of VMS includes the costs for installation, VMS transceiver unit, annual maintenance, replacement cost, cost to transmit hourly positions and declaration reports. Table 4.3.4.1 shows the estimated cost burden per vessel for VMS.

Table 4.3.3.1. Estimated burden, per vessel, for the VMS monitoring systems

	<u>Alternative 1</u> Status quo	<u>Alternatives 2-7</u> Cost per vessel for VMS and declaration reports
Installation - start up cost	\$0	Minimal - not to exceed 4 hours or \$200 Most are do-it yourself installation, manufacturer install approximately \$200 do-it-yourself \$120 5 min to complete installation report, \$3 to send fax to NMFS
VMS transceiver/transponder unit - start up cost	\$0	\$1,000 - \$2,500 (\$3,800 if computer is added for 2-way communications including email)
Annual maintenance * Self * Professional	\$0	2 hours or \$60 per year 2 hours or \$160 per year
Annual replacement costs (unit cost/years of service)	\$0	\$250-\$625 per year (estimate based on 4 years of service)
Annual cost to transmit 24 hourly position reports	\$0	\$192-\$730 (\$15.99/mo-\$2/day)
Annual cost to transmit exemption reports (4 min/rpt 2 per year)	\$0	\$0 (toll free call)
Annual cost to transmit declaration report (4 min/rpt- 12 time per year)	\$0	\$0 (toll free call)

Installation - The time burden for installation of the units is estimated at 4 hours per vessel, or \$120. Personnel costs are estimated to be \$30 per hour (Table 4.3.3.4.). The actual installation time for a VMS unit is estimated to be less than two hours, but a higher estimate of 4 hours/vessel is based on a worst case scenario where the power source (such as a 12 volt DC outlet) is not convenient to a location where the VMS unit can be installed. Most of the systems are do-it-yourself installations.

The installation of the Inmarsat-C Thrane units are do-it-yourself. The installation of software and attachment of a personal computer or lap top to an Inmarsat-C unit may also require dealer assistance. Satamatics and Orbcomm units can be self installed. However, vendor experience indicates that professional installations provide the best results for optimal unit performance.

Installation/Activation Report - Given that the VMS hardware and satellite communications services are provided by third parties as approved by NMFS, there is a need for NMFS to collect information on the individual vessel's installation in order to ensure that automated position reports will be received. This information collection would not increase the time burden for installation of VMS, but does require that a certification and checklist be returned to NMFS prior to using the VMS transceiver to meet regulatory requirements.

The checklist indicates the procedures to be followed by the installers. The VMS installer completes the NMFS issued checklist and signs the certification before returning it to NMFS. Signing the completed checklist shows that the installation was done according to the instructions and provides the Office of Law Enforcement with information about the hardware installed and the communication service provider that will be used by the vessel operator. Specific information that links a permitted vessel with a certain transmitting unit and communications service is necessary to ensure that automatic position reports will be received properly by NMFS. In the event that there are problems, NMFS will have ready access to a database that links owner information with installation information. NMFS can then apply troubleshooting techniques to contact the vessel operator and discern whether the problem is associated with the transmitting hardware or the service provider.

The time and cost burden of preparing and submitting installation information to NMFS is minor. Submission of a checklist would be required only for the initial installation or when the hardware or communications service provider changes. NMFS estimates a time burden of 5 minutes (\$2.50 at \$30 per hour) for completing the checklist and additional \$3 for mailing/faxing to NMFS, for a total of \$5.50 per occurrence (Table 4.3.3.4).

The ability for NMFS to ensure proper operation of the VMS unit prior to the vessel's departure will save time and money. The installation checklist and activation report are available over the internet website. These reports would be faxed or mailed to NMFS.

VMS transceiver unit On September 23, 1993, NMFS published proposed VMS standards at 58 FR 49285. On March 31, 1994, NMFS published final VMS standards at 59 FR 15180. These notices stated that NMFS endorses the use of VMS and defined specifications and criteria for VMS use. On September 8, 1998, NOAA published a request for information (RFI) in the Commerce Business Daily in which it stated the minimum VMS specifications necessary for NOAA's approval. The information was used as the basis for approving the mobile transceiver units and communications service providers for the Pacific coast groundfish fishery.

Units currently type approved for the Pacific Coast Groundfish Fishery are shown in (Table 4.3.3.2.) And include: Thrane and Thrane TT 3022D and 3026, Satamatics SAT101, and Stellar ST2500G. NMFS Type approved units are tested and approved by NMFS OLE. A list of VMS mobile transponder units and communications service providers approved by NOAA for the Pacific Coast groundfish fishery were published in the Federal Register on November 17, 2003 (68 FR 64860). Each time the list is revised, it will be published in the Federal Register. The cost of the transceivers currently type approved for the Pacific Coast groundfish fishery are shown in Table 4.3.3.2.

The North American Collection and Location by Satellite, Inc. (NACLS) is the sole service provider of the ArgoNet systems. The Argos Mar-GE and MAR-YX mobile transponder units costs \$2,000. The ArgoNet MAR GE uses NOAA polar-orbiting satellites, and, as such, it is considered a NOAA Data Collection and Location System. The use of any NOAA Data Collection and Location System is governed by 15 CFR part 911. Under these regulations, the use of a NOAA Data Collection and Location System can be authorized only if it is determined that there are no commercial services available that are adequate. In addition, special provisions have been made because of cost effectiveness to the Government, resulting in a temporary approval (3 year approval was granted for the Atlantic pelagic longline fishery).

On June 10, 2002, 50 CFR 679.7(a)(18), required all vessels fishing in the Bering sea and Gulf of Alaska using pot, hook-and-line or trawl gear that are permitted to directly fish for Pacific cod, Atka mackerel or pollock to have an operable VMS transceiver. Vessels that also participate in the WOC fisheries (primarily limited entry vessels) qualified for reimbursements to the Argos MAR-GE as a result of their participation in the Alaska groundfish fishery. Allowing the use of Argos MAR-GE by WOC operating vessels that have purchased these units for participation in the Alaska groundfish fisheries would eliminate the cost of purchasing, installing and maintaining a second unit for these vessels. As of April 15, 2004(69 FR 19985) new provisions for the Alaska fisheries prohibit the installation of new Argos units. Replacement units will need to be compatible with the requirements of both fisheries or vessels will need to purchase separate units. Similarly, allowing vessels to use units they have already purchased for other business purposes, providing they are a type-approved model with the required software and hardware, would also eliminate

the cost of purchasing, installing and maintaining a second unit for these vessels. The number of open access vessels that currently have VMS transceivers is unknown.

Most of the VMS transceiver units can be operated for extended periods from the same DC power source used to run other on board electronic equipment and so should increase power consumption only marginally.

Maintenance of transponder unit Once a vessel is used for fishing in the open access fishery in Federal waters, the vessel operator is required to operate the VMS unit continuously for the remainder of the year. This means that the vessel operator will need to maintain the transponder unit, antennas, and the electrical sources that power the system themselves or have it serviced by a professionally.

When an operator is aware that transmission of automatic position reports has been interrupted, or when notified by NMFS that automatic position reports are not being received, they must contact NMFS and follow the instructions provided. Such instructions may include, but are not limited to, manually communicating to a location designated by NMFS the vessel's position or returning to port until the VMS is operable. There is a reporting burden associated with this requirement, but it is not expected to be substantial. The annual burden of these communications and the time required to maintain the antennas and electrical systems on the vessel operator is estimated to be approximately 2 hours per year or \$60 if done by the vessels personnel, or \$160 if professionally serviced (Table 4.3.3.4). In addition, some systems may require software to be updated. Many of the transponders can have their set of features upgraded by being reloaded/flushed with updated versions.

If a unit needs to be repaired, there may be fishing opportunity lost unless the unit can be quickly replaced.

Replacement cost (purchase price/years of service) The various VMS transceivers have similar life spans of about 4- 5 years before the units need to be replaced. Because of advancements in VMS systems or service providers that may no longer provide services, some models may become obsolete in less than 5 years. The purchase of these units may be considered as a tax deductible business expense during the first year of use. For depreciation purposes, VMS devices using satellite technology may qualify as "five-year property", although devices using cell phone technology probably will be treated similar to other cell phone equipment, as "seven-year property." For the purposes of this analysis, 4 years was used to estimate unit replacement costs. Table 4.3.3.4. shows the range of replacement costs.

Cost to transmit hourly positions The primary costs after purchase and installation of a VMS is the charge for the messages that communicate the vessel's position. Once installed and activated, position reports are transmitted automatically to NMFS via satellite. Once a vessel is used for fishing in the open access fishery in Federal waters, the vessel operator is required to operate the VMS unit continuously for the remainder of the year. The total costs for these messages depend on the system chosen for operation and the number of fishing days for units with a sleep function. Many of the systems have a sleep function. Position transmissions are automatically reduced when the vessel is in port. This allows for port stays without significant power drain or power shutdown. When the unit restarts, normal position transmissions automatically resume before the vessel goes to sea.

The estimated time per response varies with type of equipment and requirement. Upon installation, vessel monitoring or transponder systems automatically transmit data, which takes about 5 seconds, except when issued a VMS exemption or when the vessel is inactive in port and the VMS goes into sleep mode. Transmission costs vary between units, with some having daily rates or monthly rates. The daily rate for the Inmarsat D+ , Inmarsat C, and Orbcom units is \$2, while providers have begun providing packages as low as \$15.99/mo for fishers who spend much of the month tied to the dock, resulting in reduced position reports (Table 4.3.3.4).

Table 4.3.3.2. VMS Equipment Currently in Type-approved for use in the Pacific Coast Groundfish Fisheries

Communication Service	Orbcomm	Inmarsat D+	Argos a/	Inmarsat-C
Transceiver/transponder name	SST2500G-NMFS	Satamatics SAT101	MAR GE	Thrane and Thrane TT3022D, TT3026D
Number of boats using				
Geographic coverage, when in line of sight of satellite or cell	Global	Global	Global	Global to 78°N/S
Communication between ship – shore	Two-way	Two-way	One-way, (ship-to-shore)	Two-way
Satellite type	Low earth orbit, Orbcomm Network	Geo-stationary, INMARSAT	Polar-orbiting, 5 NOAA meteorological	Geo-Stationary, INMARSAT
Time between the vessel position fix and receipt at NMFS	Within 5-10 minutes	Within 5-10 minutes	Varies per latitude, Alaska – 10-30min. avg. wait. HMS – 60-90min. wait	Within 5-10 minutes
Ability to poll/query the transceiver	Yes	Yes	No	Yes
Interval between position reports	Configurabel	Configurabel	30 - 60 minutes depending upon latitudes	Configurable for 5 minutes to 24 hours
Ability to change the interval between position reports	Remote from OLE	Remote from OLE	Factory reprogramming	Remotely from OLE
Position calculation (accuracy)	Integrated GPS (20 m)	Integrated GPS (20 m)	Integrated GPS (20m), reverts to Doppler when GPS blocked (350 or 1000m)	Integrated GPS (20m)
Automatic anti-tampering and unit status messages	Yes	Yes	Yes	Yes
Distress signal	Yes	Yes	Yes	Yes
Reduces power when stationary	Yes	Yes	Yes	Yes
Installation	Do-it-yourself	Do-it-yourself	Do-it-yourself	Dealer or electrician (costs not included), or do-it-yourself
Internal battery back-up	Yes	Yes	Yes, 48-hour	No
Log or memory buffer storing positions / number of positions	Yes	Yes	Yes, must download manually/?	Yes, auto, remote or manual download/ Trimble – 5000 Thrane – 100
Can send logbook/catch report data	Yes	Yes, limited	Yes, with computer	Yes, with computer
Transceiver/transponder cost	\$1,200	\$1,200	\$2000 (\$400 keypad optional)	Thrane TT3022D \$2,500, TT3026M \$1,550; additional \$1,300 if optional computer for email is included
Daily communications cost for hourly positions	\$2	\$2	\$5	\$2

a/ The Argos MAR GE is only allowed for vessels that have been required to have this model for other fisheries such as the Alaska groundfish fishery

Exemption reports Exemption Reports would be sent by the vessel owner or operator whenever their vessel qualified for being excused from the requirement to operate the mobile transceiver unit continuously 24 hours a day throughout the calendar year (e.g. when the vessel will be operating outside of the EEZ for more than 7 consecutive days or the vessel will be continuously out of the water for more than 7 consecutive days). A vessel may be exempted from the requirement to operate the mobile transceiver unit continuously 24 hours a day throughout the calendar year if a valid exemption report, is received by NMFS OLE and the vessel is in compliance with all conditions and requirements of the exemption. An exemption report would be valid until a second report was sent canceling the exemption.

Improved technology would be used to reduce the reporting burden on NMFS and the fishery participants. Vessels will call in exemption reports to a toll free number. With this system, vessels can call quickly and easily submit their report 24 hours a day.

Aside from the cost in time to summarize and call in an IVR report, there will be no additional cost burden for respondents. All respondents are assumed to have access to a telephone. The telephone call will be placed through a toll-free number, so the respondent will not pay for the call. Two exemption reports are estimated to be submitted per vessel annually. Each report would require approximately 4 minutes to submit, for an average cost of \$4 per vessel per year (at \$30 per hour) .

Declaration reports

Declaration reports are used to assist enforcement in identifying vessels that are legally fishing in conservation areas. Each declaration report is valid until cancelled or revised by the vessel operator. After a declaration report has been sent, the vessel cannot engage in any activity with gear that is inconsistent with that which can be used in the conservation area unless another declaration report is sent to cancel or change the previous declaration. Declaration reports are sent to NMFS and vessel operators receive confirmation that could be used to verify that the reporting requirement was met. It is necessary for a vessel owner, operator or representative to submit these reports because only they can make statements about where they intend to fish.

Vessels will call in declaration reports by dialing a toll-free, so the respondent will not pay for the call. The system allows vessels to quickly and easily submit their report 24 hours a day. Aside from the cost in time to summarize and call in an IVR report, there will be no additional cost burden for respondents. All respondents are assumed to have access to a telephone.

Table 4.3.3.3 Range of VMS of projected costs to the fleet, by fishery and gear

Open access gear group	Average annual no. of vessels landing groundfish, 2000-2003	Cost to the fleet for VMS		
		Year 1, range of cost for purchase and installation of VMS units - Per vessel cost - \$1,200 - \$2,500 (\$3,800 with PC)	Subsequent years, range of costs for maintenance and replacement of VMS units Per vessel cost \$310 - \$785	Range of annual Transmission cost Per vessel cost \$192 - \$730
Longline - groundfish directed a/	131	157,200 - 353,700 (497,800)	40,610 - 102,966	25,152 - 95,630
Longline - Pacific Halibut directed b/	31	37,200 - 83,700 (117,800)	9,610 - 24,366	5,952 - 22,630
Longline - CA Halibut c/	1	1,200 - 2,700 (3,800)	310 - 786	192 - 730
Pot - groundfish directed	30	36,000 - 81,000 (114,000)	9,300 - 23,580	5,760 - 21,900
Pot - Dungeness crab d/	45	54,000 - 121,500 (171,000)	13,950 - 35,370	8,640 - 32,850
Pot - prawn/shrimp e/	8	9,600 - 21,600 (30,400)	2,480 - 6,288	1,536 - 5,840
Pot - sheephead g/	8	9,600 - 21,600 (30,400)	2,480 - 6,288	1,536 - 5,840
Pot - CA Halibut	37	44,400 - 99,900 (140,600)	11,470 - 29,082	7,104 - 27,010
Trawl - spot prawn f/	6	7,200 - 16,200 (22,800)	1,860 - 4,716	1,152 - 4,380
Trawl - CA Halibut g/	17	20,400 - 45,900 (64,600)	5,270 - 13,362	3,264 - 12,410
Trawl - Sea Cucumber h/	6	7,200 - 16,200 (22,800)	1,860 - 4,716	1,152 - 4,380
Trawl - Ridgeback Prawn i/	18	21,600 - 48,600 (68,400)	5,580 - 14,148	3,456 - 13,140
Line gear - groundfish directed j/	738	885,600 - 1,992,600 (2,804,400)	228,780 - 580,068	141,696 - 538,740
Line gear - CA halibut directed k/	105	126,000 - 283,500 (399,000)	32,550 - 82,530	20,160 - 76,650
Line gear - HMS l/	12	14,400 - 32,400 (45,600)	3,720 - 9,432	2,304 - 8,760
Line gear - Salmon troll (coastwide) m/	177	212,400 - 477,900 (672,600)	54,870 - 139,122	33,984 - 129,210
Line gear - Salmon troll (north only)	134	160,800 - 361,800 (509,200)	41,540 - 105,324	25,728 - 97,820
Net gear - CPS	3	3,600 - 8,100 (11,400)	930 - 2,358	576 - 2,190
Other gears	4	4,800 - 10,800 (15,200)	1,240 - 3,144	768 - 2,920

a/ Open access longline groundfish vessels were defined as vessels without a federal LE permit that have greater than 30% of their longline revenues from groundfish.

b/ Longline Pacific Halibut OA directed vessels were defined as vessels where more than 50% of their longline revenue was from Pacific Halibut

c/ California halibut longline vessels are defined as vessels where greater than 80% of their longline revenues were derived from cal. halibut.

d/ Dungeness crab vessels are defined as vessels where greater than 15% of their pot revenue is derived from D crab

e/ Pot Prawn vessels are defined as vessels that make more that 5% of their pot revenue from pot prawns

f/ Spot prawn trawl vessels are defined as vessels that make more than 20% of their shrimp trawl revenue from spot prawns

g/ CA Halibut trawl vessels are defined as vessels that make more than 30% of trawl revenues from California Halibut

h/ Sea cucumber trawl vessels are defined as vessels that make more than 40% of trawl revenues from sea cucumbers

i/ Ridgeback prawn trawl vessels are defined as vessels that make more than 30% of their shrimp trawl revenues from ridgeback prawns

j/ OA hook and line (non longline) directed groundfish vessels are defined as vessels which made more than 30% of their line revenues from groundfish

k/ CA halibut non-longline line vessels are defined as vessels that make more than 20% of non-longline line revenues from CA halibut

l/ HMS non-longline line vessels are defined as vessels that make more than 25% of non-longline line revenues from HMS

m/ Salmon troll vessels are defined as vessels where greater than 20% of their troll revenues are from salmon

Table 4.3.3.4. Estimated burden, per vessel, for the VMS monitoring systems

	<u>Alternative 1</u> Status quo	<u>Alternatives 2-7</u> Cost per vessel for VMS and declaration reports
Installation - start up cost	\$0	Minimal - not to exceed 4 hours or \$200 Most are do-it yourself installation, manufacturer install approximately \$200 5 min to complete installation report, \$3 to send fax to NMFS
VMS transceiver/transponder unit - start up cost	\$0	\$1,000 - \$2,500 (\$3,800 if computer is added for 2-way communications including email)
Annual maintenance * Self * Professional	\$0	2 hours or \$60 per year 2 hours or \$160 per year
Annual replacement costs (unit cost/years of service)	\$0	\$250-\$625 per year (estimate based on 4 years of service)
Annual cost to transmit 24 hourly position reports	\$0	\$192-\$730 (\$15.99/mo-\$2/day)
Annual cost to transmit exemption reports (4 min/rpt 2 per year)	\$0	\$0 (toll free call)
Annual cost to transmit declaration report (4 min/rpt- 12 time per year)	\$0	\$0 (toll free call)

Fishers who land groundfish taken incidentally in non-groundfish fisheries operating in areas outside the RCAs, and fishers who are less dependent on groundfish may choose to exit the fishery by not retaining groundfish or by not targeting groundfish. Though it is difficult to know all of the reasons why any one individual fisher would make a particular decision, is assumed that vessels making less than \$1,000 of groundfish revenue per year will likely exit the groundfish fishery and not incur the costs associated with VMS.

Tables 4.3.3.5 show by target fishery and gear, the number of fishers by revenue category. The open access groundfish fishery consists of vessels that do not necessarily depend on revenue from the fishery as a major source of income and predominately fish for other species where they inadvertently catch and land groundfish. Understanding the level of dependency that participants in this fishery have on groundfish should be considered in light of their overall fisheries revenues.

Table 4.3.3.6. shows the number of open access vessels by gross income levels of dependency for all West Coast landings. Between November 2000 and October 2001, 1,287 vessels landed groundfish in the open access sector of the groundfish fishery. Of these, 58 percent of the vessels (200) with a greater than 95 percent dependency on groundfish had less than \$5,000 of gross income from West Coast landings. These vessels would be the vessels most affected by VMS requirements. A greater proportion of vessels

with lower levels of dependency on groundfish fell within income categories greater than \$5,000. However, this table does not represent landings for years when the RCA requirements or state nearshore limited entry programs were in place. Increases in higher valued groundfish catch in 2003, primarily sablefish, which may reduce the proportion of open access vessels in the lowest (<\$5,000) income category, are not included in this table. Table 4.3.3.7 shows the annual fishing revenue for vessels landing groundfish in various open access target fisheries and with the different gears.

Table 4.3.3.5. Open access groundfish landings by gear group, 2000 - 2003 (based on 8/24/04 PacFin data)

Open access gear group	Number of vessels landing groundfish	Exvessel revenue of groundfish (\$)	Per vessel Exvessel revenue of groundfish (\$)	Exvessel revenue all fish taken with specific gear per vessel (\$)
Longline - groundfish directed				
2000	126	796,056	6,318	6,744
2001	140	713,893	5,099	5,696
2002	122	726,839	5,958	6,395
2003	137	1,087,142	7,935	8,725
4-year average	131	830,983	6,331	6,900
Longline - Pacific Halibut				
2000	32	14,011	438	3,763
2001	29	20,454	705	5,390
2002	33	18,305	555	6,640
2003	29	45,559	1,571	8,241
4-year average	31	24,582	799	5,974
Longline - CA Halibut				
2000	3	548	183	3,884
2001	1	71	71	2,212
2002	1	45	45	2,450
2003	0	0	0	0
4-year average	1	166	133	3,263
Pot - groundfish directed c\				
2000	42	316,932	7,546	8,807
2001	35	258,778	7,394	7,796
2002	33	190,771	5,781	6,163
2003	38	297,687	7,938	8,341
4-year average	30	264,282	8,809	9,584
Pot - Dungeness crab				
2000	43	134,047	3,117	48,797
2001	46	89,499	1,946	49,862
2002	43	94,502	2,198	51,666
2003	48	141,892	2,956	140,750
4-year average	45	114,985	2,555	74,275
Pot - prawn/shrimp				
2000	11	3,957	360	130,147
2001	6	11,785	1,964	118,416
2002	6	8,851	1,475	141,840
2003	7	25,635	3,662	176,648
4-year average	8	12,557	1,674	140,990
Pot - sheephead				
2000	9	18,717	2,080	65,146
2001	10	18,962	1,896	43,483
2002	11	12,271	1,116	36,194
2003	2	735	368	48,076
4-year average	8	12,671	1,584	47,357
Trawl - sea cucumber				
2000	2	29	15	5,773
2001	8	492	62	18,824
2002	7	2,204	315	24,094
2003	5	646	129	20,704
4-year average	6	843	153	19,742

Open access gear group	Number of vessels landing groundfish	Landed weight of groundfish (mt)	Exvessel revenue of groundfish (\$)	Exvessel revenue per vessel (\$)
Trawl - CA halibut				
2000	19	20,967	1,104	8,790
2001	23	11,933	519	9,063
2002	16	11,801	738	20,635
2003	10	4,867	487	11,373
4-year average	17	12,392	729	12,050
Trawl -Ridgeback Prawn				
2000	28	28,010	1,000	59,625
2001	16	13,994	875	27,965
2002	13	6,935	533	36,974
2003	15	4,347	290	27,227
4-year average	18	13,322	740	41,750
Line gear - all groundfish a/				
2000	922	1,981,665	2,149	2,177
2001	883	2,091,194	2,368	2,405
2002	683	2,135,914	3,129	3,218
2003	465	1,582,541	3,404	3,458
4-year average	738	1,947,829	2,639	2,688
Line gear - CA halibut				
2000	106	16,653	158	182,303
2001	125	40,615	325	245,723
2002	87	29,442	339	147,702
2003	104	8,233	80	161,740
4-year average	105	23,736	225	184,367
Line gear - HMS				
2000	16	3,014	188	6,020
2001	11	5,772	525	4,567
2002	13	35,035	2,695	6,559
2003	8	2,697	337	2,999
4-year average	12	11,630	969	5,330
Line gear - Salmon troll (coastwide)				
2000	227	41,432	183	29,808
2001	187	29,672	159	29,295
2002	150	26,042	174	37,764
2003	143	24,816	174	46,385
4-year average	177	30,491	173	34,713
Line gear - Salmon troll (north only)				
2000	139	30,748	221	20,719
2001	158	23,591	149	27,120
2002	122	19,236	158	32,830
2003	116	20,621	178	38,614
4-year average	134	23,549	176	29,251
Net gear - CPS				
2000	5	1,535	307	58,267
2001	2	555	278	40,669
2002	2	25	13	63,034
2003	4	2,541	635	93,151
4-year average	3	1,164	358	67,026
Other gears				
2000	8	1,183	148	41,078
2001	2	224	122	471
2002	2	258	129	1,902
2003	3	21	7	45,079
4-year average	4	427	114	31,240

- a/ Open access longline groundfish vessels were defined as vessels without a federal LE permit that have greater than 30% of their longline revenues from groundfish.
- b/ Longline Pacific Halibut OA directed vessels were defined as vessels where more than 50% of their longline revenue was from Pacific Halibut
- c/ California halibut longline vessels are defined as vessels where greater than 80% of their longline revenues were derived from cal. halibut.
- d/ Dungeness crab vessels are defined as vessels where greater than 15% of their pot revenue is derived from D crab
- e/ Pot Prawn vessels are defined as vessels that make more that 5% of their pot revenue from pot prawns
- f/ Spot prawn trawl vessels are defined as vessels that make more than 20% of their shrimp trawl revenue from spot prawns
- g/ CA Halibut trawl vessels are defined as vessels that make more than 30% of trawl revenues from California Halibut
- h/ Sea cucumber trawl vessels are defined as vessels that make more than 40% of trawl revenues from sea cucumbers
- i/ Ridgeback prawn trawl vessels are defined as vessels that make more than 30% of their shrimp trawl revenues from ridgeback prawns
- j/ OA hook and line (non longline) directed groundfish vessels are defined as vessels which made more than 30% of their line revenues from groundfish
- k/ CA halibut non-longline line vessels are defined as vessels that make more than 20% of non-longline line revenues from CA halibut
- l/ HMS non-longline line vessels are defined as vessels that make more than 25% of non-longline line revenues from HMS
- m/ Salmon troll vessels are defined as vessels where greater than 20% of their troll revenues are from salmon

Table 3.3.3.6 Number of open access vessels by gross income levels of dependency for all West Coast landings (based on data from November 2000 - October 2001) a/

Exvessel revenue from West Coast landings					
	<5,000	\$5,000-\$50,000	\$50,000-\$200,000	>\$200,000	Total
<5%	45	268	169	34	516
>5% & <35%	52	101	44	0	197
>35% & <65%	47	50	8	0	105
>65% & <95%	63	55	6	0	124
>95% & <100%	200	138	7	0	345
Total	407	612	234	34	1,287

Extracted from table 6-17a DEIS, Proposed Acceptable Biological Catch and Optimum Yield Specifications and Management Measures for the 2005-2006 Pacific Coast Groundfish fishery

a/ open access vessels with more than half of their total landings value coming from groundfish are considered to be in the directed fishery

Table 4.3.3.6. Number of open access vessels groundfish by exvessel group, 2000 - 2003 (based on 8/24/04 PacFin data)

Open access gear group	Number of open access vessels by groundfish exvessel revenue group					
	0-500	500-1000	1000-2000	2000-3000	3000-5000	>5000
Longline - groundfish directed						
2000	18	11	14	14	18	51
2001	27	13	23	15	11	51
2002	16	17	14	16	8	51
2003	17	11	24	8	21	61
4-year average	20	13	18	13	15	54
Longline - Pacific Halibut						
2000	21	4	7	0	0	0
2001	19	2	5	1	2	0
2002	22	5	4	2	0	0
2003	11	2	8	4	3	1
4-year average	18	3	6	2	1	0
Longline - CA Halibut						
2000	2	1	0	0	0	0
2001	1	0	0	0	0	0
2002	1	0	0	0	0	0
2003	0	0	0	0	0	0
4-year average	1	0	0	0	0	0
Pot - groundfish directed c\						
2000	5	4	2	4	5	16
2001	11	2	6	3	4	15
2002	5	2	4	2	8	12
2003	5	4	5	5	2	15
4-year average	7	3	4	4	5	15
Pot - Dungeness crab						
2000	29	3	2	0	1	8
2001	24	6	6	1	3	6
2002	21	5	2	3	4	8
2003	21	2	8	4	3	10
4-year average	24	4	5	2	3	8
Pot - prawn/shrimp						
2000	9	0	2	0	0	0
2001	3	2	0	0	0	1
2002	3	1	1	0	0	1
2003	3	2	0	0	0	2
4-year average	5	1	1	0	0	1
Pot - sheephead						
2000	6	2	0	0	0	0
2001	7	1	1	0	0	1
2002	7	1	2	0	0	1
2003	2	0	0	0	0	2
4-year average	6	1	1	0	0	1
Trawl - sea cucumber						
2000	2	0	0	0	0	0
2001	8	0	0	0	0	0
2002	5	2	0	0	0	0
2003	5	0	0	0	0	0
4-year average	5	1	0	0	0	0

Open access gear group	Number of open access vessels by groundfish exvessel revenue group					
	0-500	500-1000	1000-2000	2000-3000	3000-5000	>5000
Trawl - CA halibut						
2000	8	5	4	0	1	1
2001	16	3	3	1	0	0
2002	9	3	3	0	0	1
2003	7	2	0	0	1	0
4-year average	10	3	3	0	1	1
Trawl -Ridgeback Prawn						
2000	14	4	6	3	0	1
2001	12	0	2	1	1	0
2002	9	0	4	0	0	0
2003	13	1	1	0	0	0
4-year average	12	1	4	1	0	0
Line gear - all groundfish a/						
2000	534	84	106	56	62	79
2001	385	120	113	100	66	100
2002	267	91	136	40	57	91
2003	173	59	63	42	34	93
4-year average	340	89	105	59	55	91
Line gear - CA halibut						
2000	104	0	2	0	0	0
2001	121	2	0	0	2	0
2002	85	0	0	0	2	0
2003	99	4	0	0	0	0
4-year average	102	2	0	0	1	0
Line gear - HMS						
2000	15	1	0	0	0	0
2001	9	0	0	2	0	0
2002	7	2	1	0	0	3
2003	6	1	1	0	0	0
4-year average	9	1	1	1	0	1
Line gear - Salmon troll (coastwide)						
2000	218	8	0	0	0	0
2001	182	4	0	0	0	0
2002	145	3	1	0	0	0
2003	141	1	0	0	0	0
4-year average	172	4	0	0	0	0
Line gear - Salmon troll (north only)						
2000	131	7	0	0	0	0
2001	153	4	0	0	0	0
2002	121	0	0	0	0	0
2003	115	0	0	0	0	0
4-year average	131	3	0	0	0	0
Net gear - CPS						
2000	4	1	0	0	0	0
2001	1	1	0	0	0	0
2002	2	0	0	0	0	0
2003	3	0	0	0	0	0
4-year average	3	1	0	0	0	0

Open access gear group	Number of open access vessels by groundfish exvessel revenue group					
	0-500	500-1000	1000-2000	2000-3000	3000-5000	>5000
Other gears						
2000	7	1	0	0	0	0
2001	2	0	0	0	0	0
2002	2	0	0	0	0	0
2003	3	0	0	0	0	0
4-year average	4	0	0	0	0	0
a/ Open access longline groundfish vessels were defined as vessels without a federal LE permit that have greater than 30% of their longline revenues from groundfish. b/ Longline Pacific Halibut OA directed vessels were defined as vessels where more than 50% of their longline revenue was from Pacific Halibut c/ California halibut longline vessels are defined as vessels where greater than 80% of their longline revenues were derived from cal. halibut. d/ Dungeness crab vessels are defined as vessels where greater than 15% of their pot revenue is derived from D crab e/ Pot Prawn vessels are defined as vessels that make more that 5% of their pot revenue from pot prawns f/ Spot prawn trawl vessels are defined as vessels that make more than 20% of their shrimp trawl revenue from spot prawns g/ CA Halibut trawl vessels are defined as vessels that make more than 30% of trawl revenues from California Halibut h/ Sea cucumber trawl vessels are defined as vessels that make more than 40% of trawl revenues from sea cucumbers i/ Ridgeback prawn trawl vessels are defined as vessels that make more than 30% of their shrimp trawl revenues from ridgeback prawns j/ OA hook and line (non-longline) directed groundfish vessels are defined as vessels which made more than 30% of their line revenues from groundfish k/ CA halibut non-longline line vessels are defined as vessels that make more than 20% of non-longline line revenues from CA halibut l/ HMS non-longline line vessels are defined as vessels that make more than 25% of non-longline line revenues from HMS m/ Salmon troll vessels are defined as vessels where greater than 20% of their troll revenues are from salmon						

Indirect impacts are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect impacts on harvesters and processors include, long-term changes in fishing opportunity, catch availability, and catch value that could result from the VMS requirement and collection of position data.

Short-term economic losses should be offset by future increases in catch levels if increased stability in the fishery results because the integrity of RCAs is maintained. The ability to know the precise location of vessels provides for speedy identification of suspicious or illegal fishing activity in relation to closed areas. Rather than spending significant resources on routine surveillance, enforcement resources can be directed to vessels operating in an unusual manner in the RCAs. Improved enforcement is in the interest of all fishers. Fishers and processors will be the ultimate beneficiaries when the fisheries regulations, developed for conservation and management are properly implemented and enforced. Maintaining the integrity of closed areas that are designed to protect overfished stocks, will aid in the recovery of the stocks and help to guaranteed the future of the industry.

With VMS, the law-abiding skipper can be satisfied that there will be less likelihood of the enforcement officers inspecting vessels that comply with the closed area regulations and a greater probability that inspection will focus on vessels that are suspected of violating the regulations. At times, the commercial fishing industry is subjected to criticism from members of the public and from other stakeholder groups regarding its responsibility to the environment in terms of complying with closure regulations intended to protect vulnerable species. While there may be some irresponsible operators, it is generally believed that the majority of commercial operators abide by closed area restrictions. VMS offers the commercial industry a mechanism to demonstrate its compliance with such regulations and hence honor its responsibility to the long-term sustainability of fisheries resources.

Electronic marketing is growing in importance in many industries, and could be developed for the fishing industry. If a sufficient number of vessels participating in the West Coast fisheries have 2-way communications through VMS and a computer, opportunities to market seafood through e-commerce services (electronic marketing systems) could become more readily available to the West Coast fishing industry. The ability to access the internet via Inmarsat makes likely that electronic marketing of seafood will become established as individual companies set up their own systems.

Electronic marketing system could become a component used to match the supply of fish from a number of

scattered producers with the demand from a variety of markets. An advantage of an electronic marketing systems is that the trading function is separate from the physical transfer of catch between sellers and buyers, which could allow prices to be formed centrally without the costly process of assembling buyers and sellers at a single location. As fishermen are made more aware of electronic market potential, they may choose to alter fishing practices to avoid gluts, avoid catching lower value species, or retain incidentally caught species because they find a buyer while still at sea. The overall result could be a more competitive market and improvement in the use of mixed catches, including the sale of fish that would otherwise have been discarded at sea. While electronic marketing of seafood has been technically possible for some years, extensive and high quality ship-to-shore communications were required to enable fishermen to communicate catch information to a shore-based computer linked into the system. Recent advancements in satellite technology, such as those made by Inmarsat makes it possible to bypass this impediment, allowing electronic marketing in the fishing industry much more feasible for small businesses, such as those found in the West Coast.

Comparison of the Alternatives

Alternative 1, is the least expensive alternative in the short-term since it only requires exempted trawl vessels to provide declaration reports prior to leaving port on a trip in which fishing occurs in an RCA. The greatest difficulty in maintaining the integrity of closed areas to ensure recovery of the overfished stocks occurs under status quo. In the long- term, if unmonitored incursions into the RCA affect the recovery of overfished stocks, fishing opportunity may be further reduced.

Alternatives 2-7 contain VMS requirements, for different gear groups within the open access fleet. The per vessel costs for a transceiver unit with installation is the same under all of the alternative: \$1,200-\$2,700 in Year 1, and \$250-\$625 in subsequent years. Annual operating cost to harvesters include: maintenance, \$60-\$160, and transmission fees, \$192-\$730. Fishers who land groundfish taken incidentally in non-groundfish fisheries and fishers who are less dependent on groundfish may choose to exit the fishery by not retaining groundfish or by not targeting groundfish. Under each of the Alternatives 2-7, Vessels that make less than \$1,000 in annual groundfish exvessel revenue and would likely leave the fishery

Alternative 2 maintains the provisions of status quo, but adds the VMS and declaration reporting requirements for approximately 131 directed groundfish, 31 Pacific halibut, 1 California halibut, and 2 HMS vessels using longline gear that take and retain, possess or land groundfish. Of the alternatives that require VMS, Alternative 2 requires the smallest proportion of the open access fleet (only 165 vessels using longline gear) to have and use VMS. The total cost of Alternative 2 to industry ranges between \$249,150 - \$756,690 for year 1, and \$51,150 - \$129,690 in subsequent years. An unknown portion of directed groundfish vessels using longline gear to take and retain, possess or land groundfish may choose to change gears to pot or line gear avoid VMS requirements.

Alternative 3 includes the same vessels as Alternative 2, but adds the VMS and declaration reporting requirements for approximately 128 vessels using pot gear. The estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is \$442,430 - 1,343,699 in year 1, and \$90,830-\$230,298 in subsequent years. An unknown portion of directed groundfish vessels using pot gear may choose to change to line gear to avoid VMS requirements.

Alternative 4 includes the same vessels as Alternative 3, but adds the VMS and declaration reporting requirement for approximately 18 ridgeback prawn, 6 sea cucumber and 17 California halibut vessels using exempted trawl gear (excludes pink shrimp vessels). Estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is \$442,430 - 1,343,699 in year 1, and \$90,830-\$230,298 in subsequent years. Vessels using exempted trawl gear that make less than \$1,000 in annual revenue from groundfish would likely leave the open access groundfish fishery.

Alternative 5A includes the same vessels as Alternative 4, but adds the VMS and declaration reporting requirements for approximately 738 vessels groundfish, 105 California halibut, and 12 HMS vessels using line gear to take and retain, possess or land groundfish(excludes salmon troll vessels). The estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is \$1,795,390 - 5,452,754 in year 1, and \$368,590 - \$934,554 in subsequent years.

Alternative 5B, includes slightly more vessels than 5A because the number of salmon troll vessels that would be added under this alternative is greater than the number of HMS and Dungeness crab vessels that would not be included. Though alternative 5B does not include vessels in fisheries that are projected to have minimal impacts on overfished species (12 HMS line and 2 longline, 45 Dungeness crab pot), it includes approximately 241 salmon troll vessels. The estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is \$1,973,570 - \$5,993,902 in year 1, and \$405,170 - \$1,027,302 in subsequent years.

Alternative 6A, which applies to any vessel engaged in commercial fishing to which a RCA restriction applies, includes the largest number of open access vessels. The estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is \$2,148,730-\$6,525,878 in years 1, and \$441,130 - \$1,118,478 in subsequent years. Vessels making less than \$1,000 in annual revenue from groundfish. Unlike 5B, all exempted trawl vessels would be included rather than only those that take and retain, possess or land groundfish. Therefore, Alternative 6A would provide coverage for the largest number of vessels, which supports the greatest flexibility in the use of management rules with geographical areas.

Alternative 6B, affects approximately 79 fewer vessels annually than does Alternative 6A, all of which use salmon troll gear. The estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is \$399,590-\$1,013,154 in years 1, and \$1,946,390 -\$5,911,354 in subsequent years. Under 6B, the vessels that are likely to leave the fishery is the same as Alt. 6A , except that the number of salmon trollers that are likely to leave the fishery is slightly less because vessels fishing north of 40°10' N. lat. that only land yellowtail rockfish would not be required to have VMS. Alternative 7, is essentially the same as Alternative 6A because it applies to the same vessels except that vessels less than 12 feet in length would be excluded. Most, if not, all vessels under 12 feet in length are not expected to fish in Federal waters and would therefore not trigger the VMS requirement.

SOCIO-ECONOMIC ENVIRONMENT	
SAFETY	Changes in search and rescue capability resulting from the requirement to carry and use VMS
Alternative 1 Status quo	<u>Direct impact</u> EPIRBS are the primary device used to identify a vessel's location in an emergency situation. VHF radios are also used.
Alternative 2 Vessels using longline gear	<p><u>Direct impact</u> May provide position information that can be used to aid in search and rescue efficiency for 165 OA longline vessels. If VMS transceiver unit has distress signal, it may further reduce response time in an emergency.</p> <p><u>Indirect impacts</u> If VMS results in those fishers who are less dependent on groundfish revenue leaving the fishery, higher catch limits may result for those vessels that remain in the fishery. If fishing opportunity improves and profits to the individual vessel increase there may be fewer of these marginal vessels that tend to display more risk prone behavior including, the tendency to not adequately maintain equipment and vessels.</p>
Alternative 3 Vessels using longline or pot gear	<u>Direct impact & Indirect Impacts</u> Same as Alt.2, but adds 30 directed, 45 Dungeness crab, 8 prawn, and 37 California halibut vessels using pot gear
Alternative 4 Vessels using longline, pot or trawl gear, except pink shrimptrawl	<u>Direct impact & Indirect Impacts</u> Same as Alt. 2 and 3, but adds approximately 41 vessels (18 ridgeback prawn, 6 sea cucumber and 17 California halibut vessels) using exempted trawl gear (excludes pink shrimp vessels) that take and retain, possess or land groundfish.
Alternative 5A Vessels using longline, pot, trawl or line gear, except: pink shrimp trawl and salmon troll	<u>Direct impact & Indirect Impacts</u> Same as Alt. 2, 3 and 4, plus 855vessels (738 vessels groundfish, 105 California halibut, and 12 HMS vessels) using line gear to take and retain, possess or land groundfish(excludes salmon troll vessels).
Alternative 5B Vessels using longline, pot, trawl or line gear, except: pink shrimp trawl, HMS longline & line, and Dungeness crab pot gear.	<u>Direct impact & Indirect Impacts</u> Same as Alt. 2, 3, 4 and 5A, except 12 HMS line and 2 longline, 45 Dungeness crab pot are not included, but an additional 177 salmon troll vessels are included. 1,307 vessels total.
Alternative 6A Vessels with RCA restrictions	<u>Direct impact & Indirect Impacts</u> In addition to benefits identified under Alt. 2, 3, 4, & 5A, increases data on fishing effort and fishing location relative to areas where overfished species are distributed from approximately 177 vessels using salmon troll gear, 39 vessels using exempted trawl gear, and an additional 18 Pacific Halibut vessels. 1,423 vessels total.

<u>Alternative 6B</u> Vessels with RCA restrictions except salmon troll north that retain only yellowtail rockfish	<u>Direct impact & Indirect Impacts</u> Same as Alt. 6A, but affects approximately <134 fewer vessels annually than does 6A because salmon troll vessel fishing north of 40°10' N. lat. that only land yellowtail rockfish would be excluded.
<u>Alternative 7</u> Vessel >12 ft with RCA restrictions	<u>Direct impact & Indirect Impacts</u> Same as Alt. 6A, but benefits are slightly reduced from those identified under Alt. 6A because approximately 22 vessels/yr (6 longline, 2 pot, and 14 line gear) each less than 12 feet in length, would not be carrying VMS transceivers.

4.3.4 Safety of Human life

Direct Impacts on the safety of human life at sea primarily consists of changes in search and rescue capability.

Response time to any incident at sea requires clear communications about the problem and the needs of the vessel's crew, an ability to quickly identify the location of the vessel, and the capability to either provide adequate information or to reach the vessel for an at seas rescue. An EPIRB is an emergency notification device that is automatically released when a vessel sinks. After the EPIRB is released, it floats to the surface and automatically begins sending out an emergency distress signal that identifies the vessel location. Unfortunately, these devices do not always work as intended and a certain proportion of the units fail to work at all.

Though VMS transceivers are not replacements for EPIRBs, they can aid the USCG in search and rescue efforts when other sources of emergency information are not available. If an EPIRB or other safety system fails to transmit a vessel's last location, or if the vessel's last location is in question, VMS could be used to identify the vessel's last known position. Similarly, if a vessel's position reports fail to be received over a period of time, it may be used to alert processing center staff to a potential problem that can be forwarded to the USCG for further investigation. Though VMS shows where a vessel is located it becomes ineffective should the power be lost or a vessel sinks. Unlike EPIRBs which have their own power source, VMS is dependent on the vessel for power. Most VMS systems have distress buttons and some allow for two-way communications. Having the 2-way communication can aid in obtaining information about vessel safety and medical issues.

Indirect impacts on safety as a result of VMS would result if VMS altered risk prone behavior. When fishing opportunity is reduced and profits are marginal, vessels may display more risk prone behavior and may not adequately maintain equipment and vessels. If VMS results in those fishers who are less dependent on groundfish revenue leaving the fishery, higher catch limits may result for those vessels that remain in the fishery. Though farther removed in time, increases in groundfish revenue from increased trip limits could result in vessels being better maintained. Similarly, if the integrity of the RCA can be maintained, the potential for recovery of overfished stocks is more likely and future harvest rates are more likely to increase

There is a certain degree of danger associated with groundfish fishing, however, little is known about the connection between fisheries management measures and incident, injury, or fatality rates in the fishery. Moreover, little is known about risk aversion among fishers or the values placed on increases or decreases in different risks.

There are safety concerns when small vessels are encouraged to fish in deeper waters and farther from assistance. Extended transits will result in longer exposure to harsh weather conditions, especially during winter months. This problem is compounded by the relatively small size and slow speed of many open access fishing vessels which will make it difficult for them to run from weather or return to port before sea conditions become hazardous. Small vessels are not able to withstand rough seas as well as larger vessels. The VMS provisions currently in regulation set a standard that prohibits groundfish directed vessels from drifting in the RCAs. This provision would apply to the open access fisheries as well.

Comparison of the Alternatives

Safety is expected to vary with the alternatives because of the difference in vessel coverage and the VMS information that may be available in an emergency situation. No information regarding a vessel's fishing location is provided under Alternative 1, status quo. Alternative 2 maintains the provisions of status quo, but adds the VMS requirements for approximately 131 directed groundfish, 31 Pacific halibut, 1 California halibut, and 2 HMS vessels using longline gear. Of the alternatives that require VMS, Alternative 2 requires the smallest proportion of the open access fleet (only 165 vessels using longline gear) to have and use VMS and would therefore provide the least safety benefit of the VMS alternatives. Alternative 3, includes

the same vessels as Alternative 2, but adds the VMS and declaration reporting requirements for approximately 128 vessels (30 directed, 45 Dungeness crab, 8 prawn, 8 California sheephead, and 37 California halibut vessels) using pot gear. Therefore, Alternative 3 would more vessels would have VMS units than Alternative 2, however there would less vessels than under Alternative 4 and therefore less of a safety benefit than Alternative 4. Alternative 4 includes the same vessels as Alternative 3, but adds the VMS and declaration reporting requirement for approximately 18 ridgeback prawn, 6 sea cucumber and 17 California halibut vessels using exempted trawl gear (excludes pink shrimp vessels). Alternative 5A includes the same vessels as Alternative 4, but adds the VMS and declaration reporting requirements for approximately 738 vessels groundfish, 105 California halibut, and 12 HMS vessels using line gear to take and retain, possess or land groundfish(excludes salmon troll vessels). Alternative 5B includes slightly more vessels than 5A because the number of salmon troll vessels that would be added under this alternative is greater than the number of HMS and Dungeness crab vessels that would not be included. Though alternative 5B does not include vessels in fisheries that are projected to have minimal impacts on overfished species (12 HMS line and 2 longline, 45 Dungeness crab pot), it includes approximately 241 salmon troll vessels. Alternative 6, which applies to any vessel engaged in commercial fishing to which a RCA restriction applies, includes the largest number of open access vessels. Therefore, Alternative 6A would have the greatest safety benefits because the greatest number of vessels will be required to carry VMS transceivers. Alternative 6B, affects approximately 79 fewer vessels annually than does Alternative 6A, all of which use salmon troll gear. Alternative 7, is almost the same as Alternative 6A because it applies to the same vessels except that vessels less than 12 feet in length would be excluded. Most, if not, all vessels under 12 feet in length are not expected to fish in Federal waters and would therefore not trigger the VMS requirement.

4.3.5 Communities

Fishing communities, as defined in the MSA, include not only the people who catch the fish, but also those who share a common dependency on directly related fisheries-dependent services and industries. Commercial fishing communities may include boatyards, fish handlers, processors, and ice suppliers. People employed in fishery management and enforcement make up another component of fishing communities. Community patterns of fishery participation vary coastwide and seasonally, based on species availability, the regulatory environment, and oceanographic and weather conditions. Communities are characterized by the mix of fishery operations, fishing areas, habitat types, seasonal patterns, and target species. Although unique, communities share many similarities. For example, all face danger, safety issues, dwindling resources, and a multitude of state and federal regulations.

Since 2003 , the Council has used a depth-based management strategy to would allow fishing to continue in areas and with gear that can harvest healthy stocks with little incidental catch of low abundance species (overfished species). Stock assessments for four overfished species, bocaccio, yelloweye, canary and darkblotched rockfish indicated that little surplus production is available for harvest. Therefore, measures must be taken to protect these stocks and rebuild them to sustainable biomass levels.

Regulations that lower fishing quotas have historically reduced the income generated by the fishing fleet. When fishing income is reduced, the coastal communities typically suffer in the short- term. Constraints on the groundfish fishery resulting from the need to rebuild overfished species could cause and economic instability of fishery participants and associated fishing communities. However, recovery of fish stocks will help coastal communities and the industry, in the long term. In the long-term, Alternatives 2-7 provide a means to ensure the integrity of the depth-based management areas and thereby mitigate undesirable or greater economic impacts associated with overfished species management. If the RCAs cannot be maintained, it is likely that management measures will need to revert back to simple closed areas and very restrictive limits, which have a greater effect on fishing communities in the short-term.

In the short-term, if the added cost results in large numbers of incidental OA groundfish vessels and vessel that have a low level of dependency on groundfish leaving the fishery, the necessary fishing supplies that would otherwise be purchased by them may result in less sales for supporting businesses. However, since

these are primarily incidental OA groundfish vessels, it would be assumed that the gear and supplies they normally purchase for the target fishery would remain unchanged.

There is a risk to low volume processors (addressed in the previous section) if a substantial number of incidental OA groundfish and less dependent fishers exit the fishery to avoid the added cost of VMS. This may particularly be a problem under Alternatives 5A-7, in which most incidental fisheries are included. If fewer incidentally caught groundfish are available, prices to processors and buyers may increase, these increases would then be passed on to the businesses that purchase the fish and the consumer. Such increases may have a negative affect on business in coastal communities that depend on groundfish products for their business.

The level of fleet coverage, that portion of the overall open access fishing fleet that would be required to have VMS and provide declaration reports, is the only difference between the alternatives. The ability to maintain the integrity of the RCAs is directly related to the level of VMS coverage for open access vessels. In general, the higher the coverage level for vessels that interact with overfished species, the more likely that it is that the integrity of the RCAs can be maintained.

4.4 Cumulative Impacts

Cumulative effects must be considered when evaluating the alternatives to the issues considered in the EA. Cumulative impacts are those combined effects on quality of human environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what federal or non-federal agency undertake such actions (40 CFR 1508.7, 1508.25 (a), and 1508.25 (c))

[Section to be completed]

5.0 CONSISTENCY WITH THE FMP AND OTHER APPLICABLE LAWS

5.1 Consistency with the FMP

The socio-economic framework in the Pacific Coast Groundfish FMP requires that proposed management measures and viable alternatives be reviewed and consideration given to the following criteria: a) how the action is expected to promote achievement of the goals and objectives of the FMP; b) likely impacts on other management measures; c) biological impacts; d) and economic impacts, particularly the cost to the fishing industry; and e) accomplishment of one of a list of factors.

GOALS AND OBJECTIVES OF THE FMP

The Council is committed to developing long-range plans for managing the Pacific Coast groundfish fisheries that prevent overfishing and loss of habitat, yet provide the maximum net value of the resource, and achieve maximum biological yield. Alternatives 2- 7 are consistent with FMP goal 1-objective 1, and goal 3-objective 10.

Goal 1- Conservation: Objective 1 -- maintain an information flow on the status of the fishery and the fishery resource which allows for informed management decisions as the fishery occurs.

Goal 3- Utilization: Objective 10 -- strive to reduce the economic incentives and regulatory measures that lead to wastage of fish. Also, develop management measures that minimize bycatch to the extent practicable and, to the extent that bycatch cannot be avoided, minimize the mortality of such bycatch. In addition, promote and support monitoring programs to improve estimates of total fishing-related mortality and bycatch, as well as those to improve information necessary to determine the extent to which it is practicable to reduce bycatch and bycatch

mortality.

ACCOMPLISHMENT OF ONE OF THE FACTORS LISTED IN FMP SECTION 6.2.3.

Under the socio-economic framework, the proposed action must accomplish at least 1 of the criteria defined in Section 6.2.3 of the FMP. Alternatives 2-7 are likely to accomplish objective 2 by providing information to avoid exceeding a quota, harvest guideline or allocation, and objective 13 by maintaining a data collection and means for verification.

5.2 Magnuson-Stevens Conservation and Management Act

The Magnuson-Stevens Act provides parameters and guidance for federal fisheries management, requiring that the Councils and NMFS adhere to a broad array of policy ideals. Overarching principles for fisheries management are found in the Act's National Standards. In crafting fisheries management regimes, the Councils and NMFS must balance their recommendations to meet these different national standards.

National Standard 1 requires that conservation and management measures shall prevent overfishing while achieving on a continuing basis, the optimum yield from each fishery for the United States fishing industry. The proposed action is to expand a monitoring program to monitor the integrity of closed areas that were established to protect overfished species. Information provided under Alternatives 2- 7 reduce the risk of overfishing because they would provide information that could be used to reduce the likelihood of overfishing while allowing for the harvests of healthy stocks. Because Alternative 6A and 7 provides the most information, they would have the least risk, while Alternative 1 has the greatest risk.

National Standard 2 requires the use of the best available scientific information. The proposed action is to expand a VMS program to monitor the integrity of closed areas that were established to protect overfished species. Data collected under Alternatives 2-7 would be used to understand the level of fishing effort and how it was distributed. When combined with data from the existing federal observer program, it could be used to more accurately estimate total catch.

National Standard 3 requires, to the extent practicable, that an individual stock of fish be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or in close coordination. This standard is not affected by the proposed action to expand a monitoring program to monitor the integrity of closed areas.

National Standard 4 requires that conservation and management measures not discriminate between residents of different States. None of the alternatives would discriminate between residents of different States.

National Standard 5 is not affected by the proposed actions because it does not affect efficiency in the utilization of fishery resources.

National Standard 6 requires that conservation and management measures take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches." All alternatives meet this standard.

National Standard 7 requires that conservation and management measures minimize costs and avoid unnecessary duplication. Measures were taken to minimize the costs of a monitoring program by reducing the time burden and cost of declaration reports - they would only be required when vessel changes gears rather than on every trip.

National Standard 8 provides protection to fishing communities by requiring that conservation and management measures be consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities. The proposed alternatives are consistent with this standard.

National Standard 9 requires that conservation and management measures minimize bycatch and minimize the mortality of bycatch. NMFS is required to "promote and support monitoring programs to improve estimates of total fishing-related mortality and bycatch, as well as those to improve information necessary to determine the extent to which it is practicable to reduce bycatch and bycatch mortality. The proposed action is consistent with this standard.

National Standard 10 Conservation and Management measures shall, to the extent practicable, promote the safety of human life at sea. Alternatives 2-7 have safety benefits. Though VMS is not an emergency response system it has been used in search and rescue to determine a vessel's last known position and the VMS system provides for a distress signal that may also reduce response time in an emergency. Alternatives 6A and 7 have the greatest safety benefits because they require VMS for the largest portion of the open access fleet, followed by 5B and then 6B.

Essential Fish Habitat This action will affect fishing in areas designated as essential fish habitat (EFH). The proposed action is to expand a program to monitor the integrity of closed areas that were established to protect overfished species. The potential effects of the proposed actions are not expected to have either no adverse effect on EFH, to have a positive effect resulting from reduced fishing effort in critical areas, or to have a positive effect if used to support regulations to restrict fishing in areas to protect habitat. No EFH consultation is warranted for this action.

5.3 Endangered Species Act

NMFS issued Biological Opinions (B.O.) under the ESA on August 10, 1990, November 26, 1991, August 28, 1992, September 27, 1993, May 14, 1996, and December 15, 1999 pertaining to the effects of the groundfish fishery on chinook salmon (Puget Sound, Snake River spring/summer, Snake River fall, upper Columbia River spring, lower Columbia River, upper Willamette River, Sacramento River winter, Central Valley spring, California coastal), coho salmon (Central California coastal, southern Oregon/northern California coastal), chum salmon (Hood Canal summer, Columbia River), sockeye salmon (Snake River, Ozette Lake), and steelhead (upper, middle and lower Columbia River, Snake River Basin, upper Willamette River, central California coast, California Central Valley, south-central California, northern California, southern California). During the 2000 Pacific whiting season, the whiting fisheries exceeded the 11,000 fish chinook bycatch amount specified in the Pacific whiting fishery B.O. (December 19, 1999) incidental take statement, by approximately 500 fish. In the 2001 whiting season, however, the whiting fishery's chinook bycatch was about 7,000 fish, which approximates the long-term average. After reviewing data from, and management of, the 2000 and 2001 whiting fisheries (including industry bycatch minimization measures), the status of the affected listed chinook, environmental baseline information, and the incidental take statement from the 1999 whiting B.O., NMFS determined that a re-initiation of the 1999 whiting BO was not required. NMFS has concluded that implementation of the FMP for the Pacific Coast groundfish fishery is not expected to jeopardize the continued existence of any endangered or threatened species under the jurisdiction of NMFS, or result in the destruction or adverse modification of critical habitat. This proposed rule implements a data collection program and is within the scope of these consultations. Because the impacts of this action fall within the scope of the impacts considered in these B.O.s, additional consultations on these species are not required for this action.

5.4 Marine Mammal Protection Act

Under the MMPA, marine mammals whose abundance falls below the optimum sustainable population level (usually regarded as 60% of carrying capacity or maximum population size) can be listed as "depleted". Populations listed as threatened or endangered under the ESA are automatically depleted under the terms of the MMPA. Currently, the Stellar sea lion population off the West Coast is listed as threatened under the ESA and the fur seal population is listed as depleted under the MMPA. Incidental takes of these species in the Pacific Coast fisheries are well under their annual PBRs. None of the proposed management alternatives are likely to affect the incidental mortality levels of species protected under the MMPA. The West Coast groundfish fisheries are considered Category III fisheries, where the annual mortality and serious injury of a stock by the fishery is less than or equal to 1% of the PBR level. Implementation of Alternatives 2-7 are expected to benefit MMPA species because they would allow observer data and data from other sources to be joined to the VMS data to better understand the extent of potential fishing related impacts on various marine mammal species.

5.5 Coastal Zone Management Act

The proposed alternatives would be implemented in a manner that is consistent to the maximum extent practicable with the enforceable policies of the approved coastal zone management programs of Washington, Oregon, and California. This determination has been submitted to the responsible state agencies for review under Section 307(c)(1) of the Coastal Zone Management Act (CZMA). The relationship of the groundfish FMP with the CZMA is discussed in Section 11.7.3 of the groundfish FMP. The groundfish FMP has been found to be consistent with the Washington, Oregon, and California coastal zone management programs. The recommended action is consistent and within the scope of the actions contemplated under the framework FMP. Under the CZMA, each state develops its own coastal zone management program which is then submitted for federal approval. This has resulted in programs that vary widely from one state to the next.

5.6 Paperwork Reduction Act

[Section to be completed]

5.7 Executive Order 12866

This action is not significant under E.O. 12866. This action will not have a cumulative effect on the economy of \$100 million or more, nor will it result in a major increase in costs to consumers, industries, government agencies, or geographical regions. No significant adverse impacts are anticipated on competition, employment, investments, productivity, innovation, or competitiveness of U.S.-based enterprises.

5.8 Executive Order 13175

Executive Order 13175 is intended to ensure regular and meaningful consultation and collaboration with tribal officials in the development of Federal policies that have tribal implications, to strengthen the United States government-to-government relationships with Indian tribes, and to reduce the imposition of unfunded mandates upon Indian tribes.

The Secretary of Commerce recognizes the sovereign status and co-manager role of Indian tribes over shared Federal and tribal fishery resources. At Section 302(b)(5), the Magnuson-Stevens Act reserves a seat on the Council for a representative of an Indian tribe with Federally recognized fishing rights from California, Oregon, Washington, or Idaho.

The U.S. government formally recognizes that the four Washington Coastal Tribes (Makah, Quileute, Hoh, and Quinault) have treaty rights to fish for groundfish. In general terms, the quantification of those rights is 50% of the harvestable surplus of groundfish available in the tribes' usual and accustomed (U and A) fishing areas (described at 50 CFR 660.324). Each of the treaty tribes has the discretion to administer their fisheries and to establish their own policies to achieve program objectives. The proposed action is being developed in consultation with the affected tribe(s) and, insofar as possible, with tribal consensus.

5.9 Migratory Bird Treaty Act and Executive Order 13186

The Migratory Bird Treaty Act of 1918 was designed to end the commercial trade of migratory birds and their feathers that, by the early years of the 20th century, had diminished populations of many native bird species. The Act states that it is unlawful to take, kill, or possess migratory birds and their parts (including eggs, nests, and feathers) and is a shared agreement between the United States, Canada, Japan, Mexico, and Russia to protect a common migratory bird resource. The Migratory Bird Treaty Act prohibits the directed take of seabirds, but the incidental take of seabirds does occur. None of the proposed management alternatives, or the Council recommended action are likely to affect the incidental take of seabirds protected by the Migratory Bird Treaty Act. Executive Order 13186 (Responsibilities of Federal Agencies to Protect Migratory Birds) is intended to ensure that each Federal agency taking actions that have, or are likely to have, a measurable negative effect on migratory bird populations develops and implements a Memorandum of Understanding (MOU) with the U.S. Fish and Wildlife Service that shall

promote the conservation of migratory bird populations. Currently, NMFS is developing an MOU with the U.S. Fish and Wildlife Service. None of the proposed management alternatives are likely to have a measurable effect on migratory bird populations.

5.10 Executive Order 12898 (Environmental Justice) and 13132 (Federalism)

There is no specific guidance on application of EO 12898 to fishery management actions. The EO states that environmental justice should be part of an agency's mission "by identifying and addressing disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority or low-income populations." These recommendations would not have federalism implications subject to E.O. 13132. State representatives on the Council have been fully consulted in the development of this policy recommendation.

6.0 REGULATORY IMPACT REVIEW AND REGULATORY FLEXIBILITY ANALYSIS

The RIR and IRFA analyses have many aspects in common with each other and with EAs. Much of the information required for the RIR and IRFA analysis has been provided above in the EA. Table 6.0.1 identifies where previous discussions relevant to the EA and IRFA can be found in this document. In addition to the information provided in the EA, above, a basic economic profile of the fishery is provided annually in the Council's SAFE document.

Table 6.0 1 Regulatory Impact Review and Regulatory Flexibility Analysis

RIR Elements of Analysis	Corresponding Sections in EA	IRFA Elements of Analysis	Corresponding Sections in EA
Description of management objectives		Description of why actions are being considered	
Description of the Fishery		Statement of the objectives of, and legal basis for actions	
Statement of the Problem		Description of projected reporting, recordkeeping and other compliance requirements of the proposed action	
Description of each selected alternative		Identification of all relevant Federal rules	
An economic analysis of the expected effects of each selected alternative relative to status quo			

[Section to be completed]

6.1 Regulatory Impact Review

[Section to be completed]

The RIR is designed to determine whether the proposed action could be considered a “significant regulatory actions” according to E.O. 12866. E.O. 12866 test requirements used to assess whether or not an action would be a “significant regulatory action”, and identifies the expected outcomes of the proposed management alternatives. 1) Have a annual effect on the economy of \$100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or state, local, or tribal governments or communities; 2) Create a serious inconsistency or otherwise interfere with action taken or planned by another agency; 3) Materially alter the budgetary impact of entitlement, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or 4) Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in this executive Order. Based on results of the economic analysis contained in Section 4.3, this action is not expected to be significant under E.O. 12866.

6.2 Initial Regulatory Flexibility Analysis

When an agency proposes regulations, the RFA requires the agency to prepare and make available for public comment an Initial Regulatory Flexibility Analysis (IRFA) that describes the impact on small businesses, non-profit enterprises, local governments, and other small entities. The IRFA is to aid the agency in considering all reasonable regulatory alternatives that would minimize the economic impact on affected small entities (attachment 1). To ensure a broad consideration of impacts on small entities, NMFS has prepared this IRFA without first making the threshold determination whether this proposed action could be certified as not having a significant economic impact on a substantial number of small entities. NMFS, must determine such certification to be appropriate if established by information received in the public comment period.

1) A description of the reasons why the action by the agency is being considered.

2) A succinct statement of the objectives of, and legal basis for, the proposed rule.

Requirements of an IRFA

The Regulatory Flexibility Act (5 U.S.C. 603) states that:

(b) Each initial regulatory flexibility analysis required under this section shall contain--

- (1) a description of the reasons why action by the agency is being considered;
- (2) a succinct statement of the objectives of, and legal basis for, the proposed rule;
- (3) a description of and, where feasible, and estimate of the number of small entities to which the proposed rule will apply;
- (4) a description of the projected reporting, recordkeeping and other compliance requirements of the proposed rule, including an estimate of the classes of small entities which will be subject to the requirement and the type of professional skills necessary for preparation of the report or record;
- (5) an identification, to the extent practicable, of all relevant Federal rules which may duplicate, overlap, or conflict with the proposed rule.

(c) Each initial regulatory flexibility analysis shall also contain a description of any significant alternatives to the proposed rule which accomplish the stated objectives of applicable statutes and which minimize any significant economic impact of the proposed rule on small entities. Consistent with the stated objectives of applicable statutes, the analysis shall discuss significant alternatives such as--

- (1) the establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities;
- (2) the clarification, consolidation, or simplification of compliance and reporting requirements under the rule for such small entities;
- (3) the use of performance rather than design standards; and
- (4) an exemption from coverage of the rule, or any part thereof, for such small entities.

3) A description of and, where feasible, and estimate of the number of small entities to which the proposed

rule will apply;

4) A description of the projected reporting, recordkeeping and other compliance requirements of the proposed rule, including an estimate of the classes of small entities which will be subject to the requirement and the type of professional skills necessary for preparation of the report or record.

5) An identification, to the extent practicable, of all relevant Federal rules which may duplicate, overlap, or conflict with the proposed rule.

6) A summary of economic impacts.

7) A description of any alternatives to the proposed rule which accomplish the stated objectives of applicable statutes and which minimizes and significant economic impacts of the proposed rule on small entities.

7.0 List of Preparers

This document was prepared by the Northwest Regional Office of the NMFS. 8.0 References

[Section to be completed]

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